TRANSPORTATION PLANNERS AND ENGINEERS

bunt & associates

303 Marine Drive

Transportation Impact Assessment

Draft Report

Prepared for

Darwin Properties Ltd.

Date

April 27, 2018

Project No.

04-17-0126

April 27, 2018
04-17-0126

Kaylen Crosse
Development Manager
Darwin Properties Ltd.
#404-197 Forester Street
North Vancouver, BC
V7H 0A6

Dear Kaylen:

Re: 303 Marine Drive
DRAFT Transportation Impact Assessment Rev. 1

The enclosed report addresses the requested updated Transportation Impact Assessment for the proposed development at 303 Marine Drive in the District of West Vancouver.

In addition to determining the off-site transportation impacts of the proposed development in relation to vehicular traffic, this report provides a high-level overview of potential active transportation strategies being contemplated for the development to help provide sustainable travel options and reduce automobile use.

This revision of the report is an update to the August 26, 2016 version to reflect the latest design of the newly proposed development. Should you have any questions / comments, please do not hesitate to contact the undersigned.

Yours truly,
Bunt & Associates

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Associate, Senior Transportation Engineer

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Transportation Analyst

CORPORATE AUTHORIZATION

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		Project No. 04-17-0126
Approved By:	FINAL ONLY	Status: DRAFT

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EXHIBITS

TABLES

1. INTRODUCTION

Bunt and Associates was retained by Darwin Properties Ltd. to prepare an updated Transportation Impact Assessment (TIA) for a development in the District of West Vancouver following changes to development's design.

The current Earl's restaurant, located at 303 Marine Drive in the District of West Vancouver (DWV), is planned to be redeveloped to a multi-family development housing 133 residential units. The purposes of this TIA are to determine the off-site transportation impacts of the proposed development in relation to vehicular traffic, review the current site plan in relation to provision of parking and proposed layout, and provide an active transportation strategy.

This report summarizes the work undertaken to fulfill the scope requirements for the site's development permit submissions, as well as our findings and recommendations for the surrounding traffic network. The scope of Bunt's study was developed in consultation with District of West Vancouver staff. For reference, the Terms of Reference (ToR) agreed upon with the District is included in **Appendix A**.

1.1 Background

The current site, located at 303 Marine Drive, is an Earl's restaurant. The site is currently accessed by one inbound and one outbound access on Marine Drive and one inbound/outbound access on Klahanie Court. Klahanie Court connects with Curling Road to the east and terminates at Capilano Road. Note that we have prepared this traffic report based on information derived from the Larco CapWest, the Pacific Gate – Grouse Inn Development, and the Lions Gate Village Peripheral Area Townhouse Developments as well as the Gateway Hotel development (on the east side of Capilano Road) as background information. In addition, a high level assumption was also made for the redevelopment of the 2050 – 2070 Marine Drive as required by the DWV. These proposed developments will be located in the vicinity of the development specifically at the existing Grouse Inn site, northwest of the Capilano Road / Marine Drive intersection, and the Larco Site located west of Capilano Road between Fullerton Avenue and Curling Road, as well as the some of the current single family houses immediately west of Capilano Road north of Marine Drive.

Exhibit 1.1 shows the location of the proposed development sites. For the purpose of analysis, the development opening day is expected to be 2020. Planning horizon for the project is 10 years after the opening day in 2030. Analysis is performed for the 2030 full build-out scenario to reflect the build-out traffic conditions.

1.2 Study Scope & Area

Exhibit 1.2 shows the general study area. The following intersections were included in the transportation impact assessment in the study:

- Curling Road / Capilano Road;

- Marine Drive / Capilano Road; and
- Fullerton Avenue / Capilano Road.

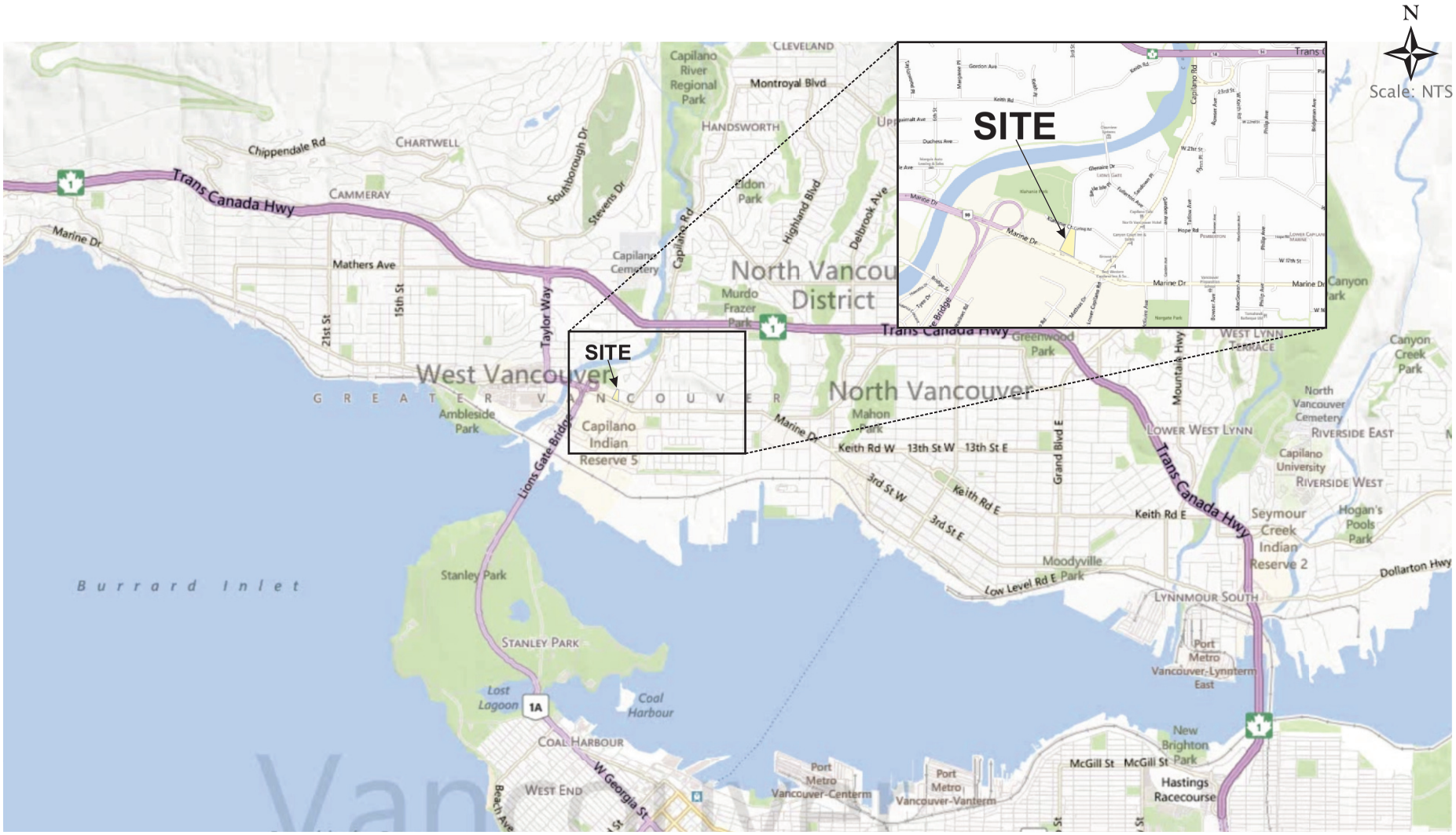

Exhibit 1.1

Site Location

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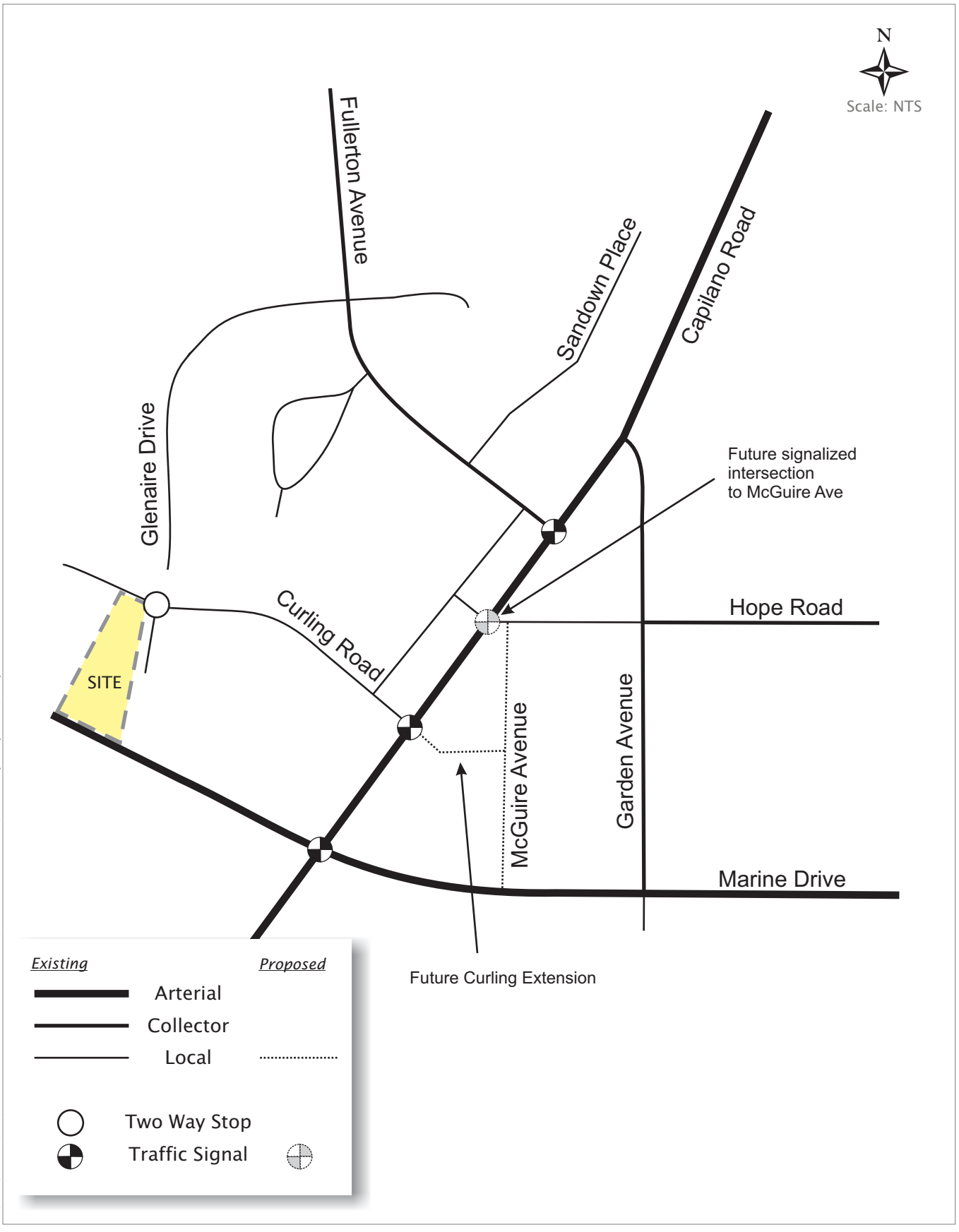

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Exhibit 1.2
Study Area

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1.3 Organization of Report

The report is divided into 6 sections, and the purpose and scope of each is discussed in the following.

- Section 1.0 Introduction: provides an overview of the proposed development and outlines the traffic impact study purpose and scope.
- Section 2.0 Existing Conditions: provides an overview of the existing traffic operations within the study area, establishing the base case scenario.
- Section 3.0 Future Traffic Conditions: summarizes the estimated site traffic generation and distribution to the study area intersections, as well as the projected future background and total traffic volumes. This section also summarizes the capacity analysis of the study area intersections.
- Section 4.0 Site Plan Review: summarizes an overview of the bylaw requirements for parking, and discusses the proposed supply. This section also provides an overview of the on-site circulation review for vehicles, loading and waste management along with site access sight lines.
- Section 5.0 TDM & Active Modes: discusses the site's sustainability features from a transportation perspective, including opportunities for Transit use, nearby bicycle routes and pedestrian facilities, as well as strategies for lowering vehicle trip generation to/from the site;
- Section 6.0 Conclusions & Recommendations: summarizes the findings and recommendations of the study.

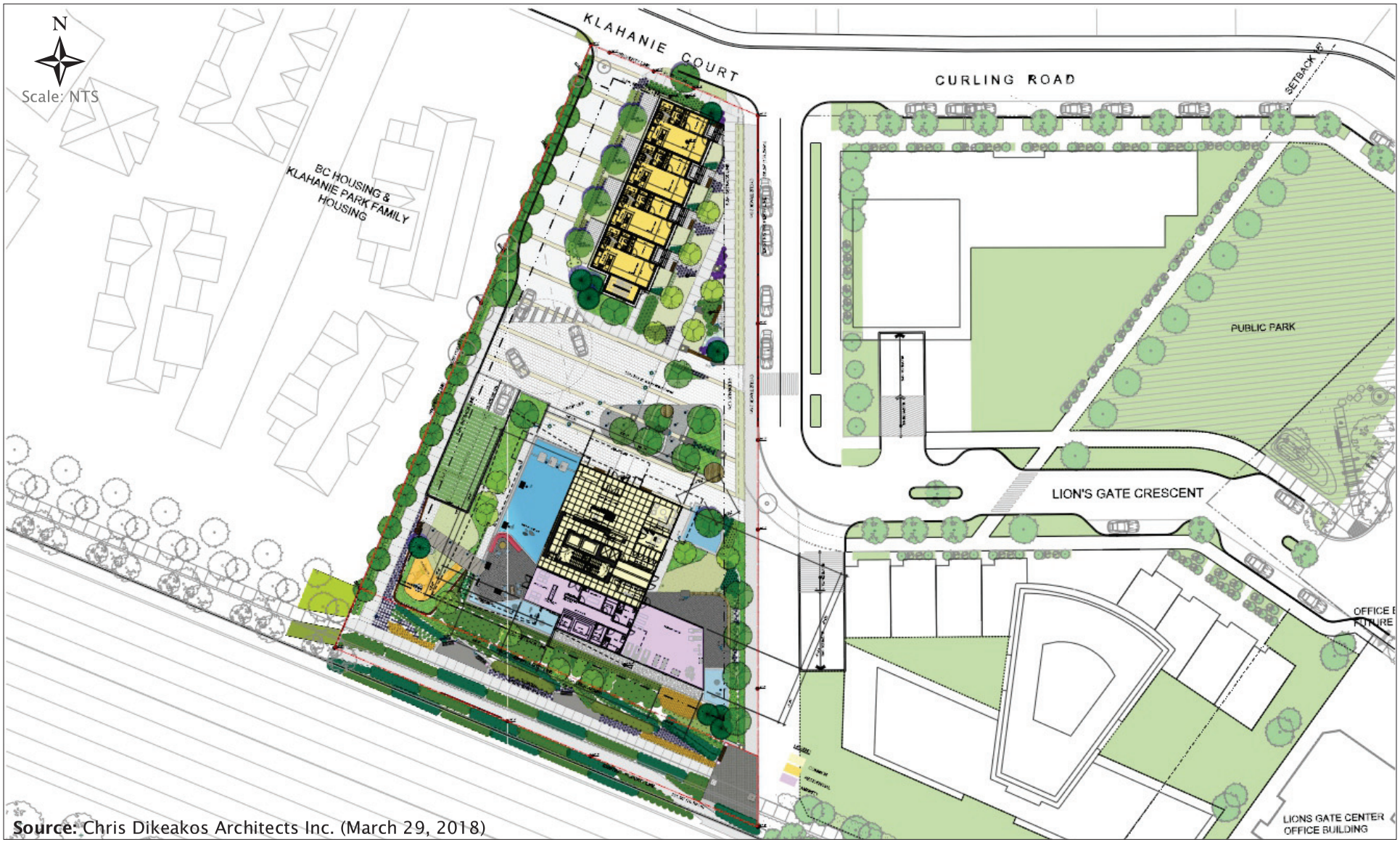
1.4 Proposed Development

The development is planned to consist of a mix of residential strata and rental units. **Exhibit 1.3** illustrates the proposed site plan layout. **Table 1.1** below summarizes the expected development uses, 42 of which are planned to be rental, with the remaining 91 strata. The proposed development has a design for one access from the north of the site on Klahanie Court.

Table 1.1: Summary of the Proposed Development Land Uses

LAND USE	UNITS
Studio	0
1 Bedroom	20
1 Bedroom + Den	0
2 Bedroom	77
2 Bedroom + Den	23
3 Bedroom	3
3 Bedroom + Den	6
3 Bedroom Townhouse	4
	133

Note: Table 1.1 statistics is based on Development Project Data by Chris Dikeakos Architects dated March 29, 2018.



Source: Chris Dikeakos Architects Inc. (March 29, 2018)

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Exhibit 1.3
Site Plan

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2. EXISTING CONDITIONS

2.1 Land Use

Per existing conditions, Capilano Road comprises of mostly residential and small commercial developments. Residential land use is primarily single family home with some multi-family developments along with the Woodcroft residential apartment towers development at the west end of Fullerton Avenue. Marine Drive, within the proposed site location block, houses a number of commercial land uses in the immediate vicinity.

2.2 Existing Transportation Network

Marine Drive is a main east-west arterial connecting North Vancouver to West Vancouver and to downtown Vancouver via the Lions Gate Bridge. Marine Drive functions both as an arterial route for longer distance trips across the North Shore and for local traffic access to area shops, services, and residential areas. Marine Drive is also a primary public transit corridor on the North Shore serving multiple routes connecting North Vancouver City and District, West Vancouver District, and the City of Vancouver via the Lions Gate Bridge and the SeaBus terminal at Lonsdale Quay. Marine Drive has 4-5 travel lanes with left turn lanes at signalized intersections and on-street parking in some areas. Given the importance of Marine Drive as a main commuter and transit route, as well as the location of the main commercial and industrial designated area for both the City and District of North Vancouver, this is a busy route, often experiencing congestion during peak hour periods and mid-day on weekends. Marine Drive also experiences recurring congestion in the vicinity of Capilano Road related to queuing for the Lions Gate Bridge.

Capilano Road is a main north-south arterial connecting the Lions Gate Bridge traffic and Marine Drive traffic to the Upper Levels Highway. Capilano Road has four travel lanes with left turn lanes at most cross streets, and has a mix of traffic signal controlled and unsignalized intersections. There are sidewalks provided on Capilano Road through the study area on both sides. No exclusive on-street cycling route currently existing between the Marine Drive and Curling Road intersections to Capilano Road, but bike lanes were implemented recently north of Fullerton Avenue on this corridor and future connectivity of said implemented bike lane to Marine Drive is planned.

Curling Road, which extends west as Klahanie Court fronting the site, is an east-west local road running parallel to Marine Drive and provides access to a mix of office, restaurants and a hotel, residences and the Capilano Rugby Club. It is not a through road and has a cul-de-sac turnaround at the western end. Curling Road has two travel lanes with on-street parking alternating on either side. There is a sidewalk along the south side of the street and provides an on-street bike connection to the Lions Gate Bridge west of the site and is proposed as a future on-street bike route as part of the North Vancouver Bicycle Master Plan. Of side note, the west end of Curling Road is within the District of West Vancouver boundary while the east end is within the District of North Vancouver boundary.

Fullerton Avenue, which extends west and then north across the Capilano River, is a collector road that provides access to a mix of vacation rental homes and residences. It is not a through road and leads to a network of various cul-de-sacs of single family homes with various turnaround areas. Fullerton Avenue has two travel lanes with on-street parking on both sides. There is a sidewalk along the south side of the street and is classified as a on-street bicycle route and provides an on-street bike connection to the Lions Gate Bridge west of the site.

Table 2.1 summarizes the existing street characteristics for the proposed study area. The existing traffic control and laning configuration for the study intersections are also illustrated in **Exhibit 2.1**.

Table 2.1: Existing Street Characteristics

STREET	CLASSIFICATION	NUMBER OF TRAVEL LANES	POSTED SPEED	PARKING FACILITIES
Marine Drive	Arterial	4-5 with left-turn lanes	50 km/h	On-street parking in some areas
Capilano Road	Arterial	4 with left-turn lanes	50 km/h	None
Curling Road	Local	2	50 km/hr	On-street parking alternating on either side
Fullerton Road	Collector	2	50 km/hr	On-street parking alternating on either side

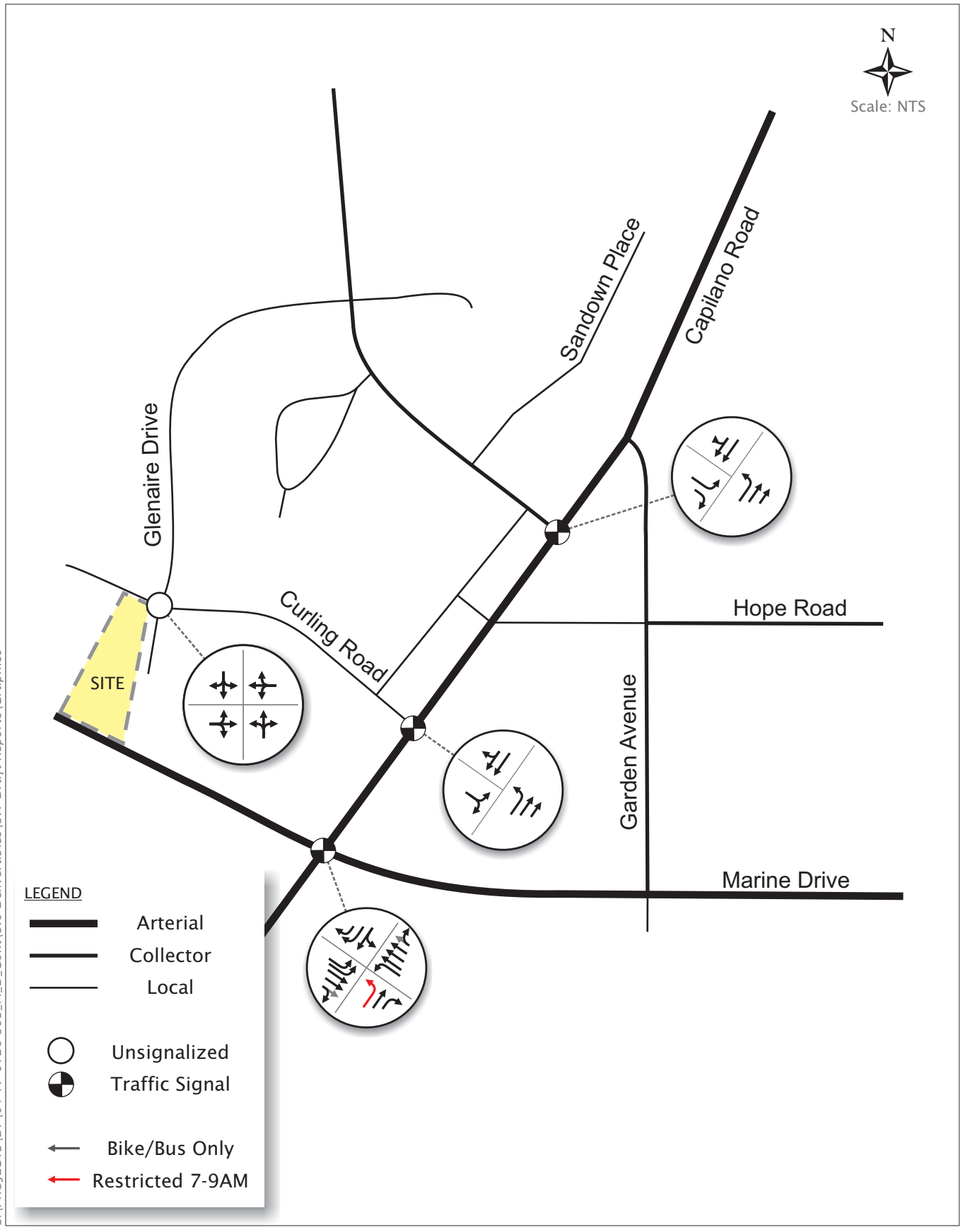

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Exhibit 2.1

Existing Laning & Traffic Control

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2.2.1 Transit Network

Within 800m walking distance from the site, there are 5 bus stops providing different service. The bus stops serve the local population to provide connections throughout the North Shore and West Vancouver. Other bus services provide connections regionally to downtown Vancouver, Burnaby, and other cities within the Lower Mainland. **Exhibit 2.2** showcases the transit network along with the location of bus stops.

Table 2.2: Transit Stops within 800m Walking Distance of Site

STOP LOCATION	DIRECTION	STOP #	ROUTES SERVICED	WALKING DISTANCE
Marine Drive and Capilano Road	WB	61563	239, 240, 241, 242, 246, 247, 255, N24	165m
Marine Drive and Capilano Road	EB	54413	239, 240, 241, 242, 255, N24	270m
Capilano Road and Curling Road	NB	61510	246, 247	300m
Marine Drive and Capilano River	WB	54607	239, 250, 253, 254, 255	520m
Marine Drive Offramp and Lions Gate Bridge	SB	61566	250, 253, 254, 257, 258	560m

Table 2.3: Existing Transit Service Frequency

ROUTE		WEEKDAY SERVICE SPAN		HEADWAY (MIN.)				
#	DIRECTION	START	END	AM	MID-DAY	PM	EVENING	SATURDAY
239	Park Royal/Lonsdale Quay Phibbs Exchange/Cap U	5:31AM	1:49AM	10	10	10	15	15
240	Vancouver / 15th Street	5:41AM	12:54AM	8	15	8	15	15
241	Vancouver / Upper Lonsdale	7:06AM	7:21PM	10	-	15	15	-
242	Vancouver / Lynn Valley	6:08AM	8:18AM	-	-	-	-	1 trip
246	Highland / Vancouver	5:37AM	12:20AM	8-14	30	15	60	30
247	Vancouver / Upper Capilano	6:58AM	6:33PM	40	-	30	-	-
250	Vancouver / Dundarave / Horseshoe Bay	5:39AM	1:23AM	10	10	10	15	10
253	Vancouver / Caulfeild	7:01AM	7:25PM	30	-	30	30	-
254	Vancouver / British Properties	7:34AM	5:23PM	30	-	30	-	-
255	Capilano University / Dundarave	6:55AM	9:33PM	20	30	15	30	30
257	Vancouver Express	6:20AM	11:01PM	20	20	20	30	30
258	UBC Express	7:12AM	9:12AM	30	-	-	-	-
N24	Lynn Valley / Downtown	1:00AM	4:17AM	-	-	-	20	20

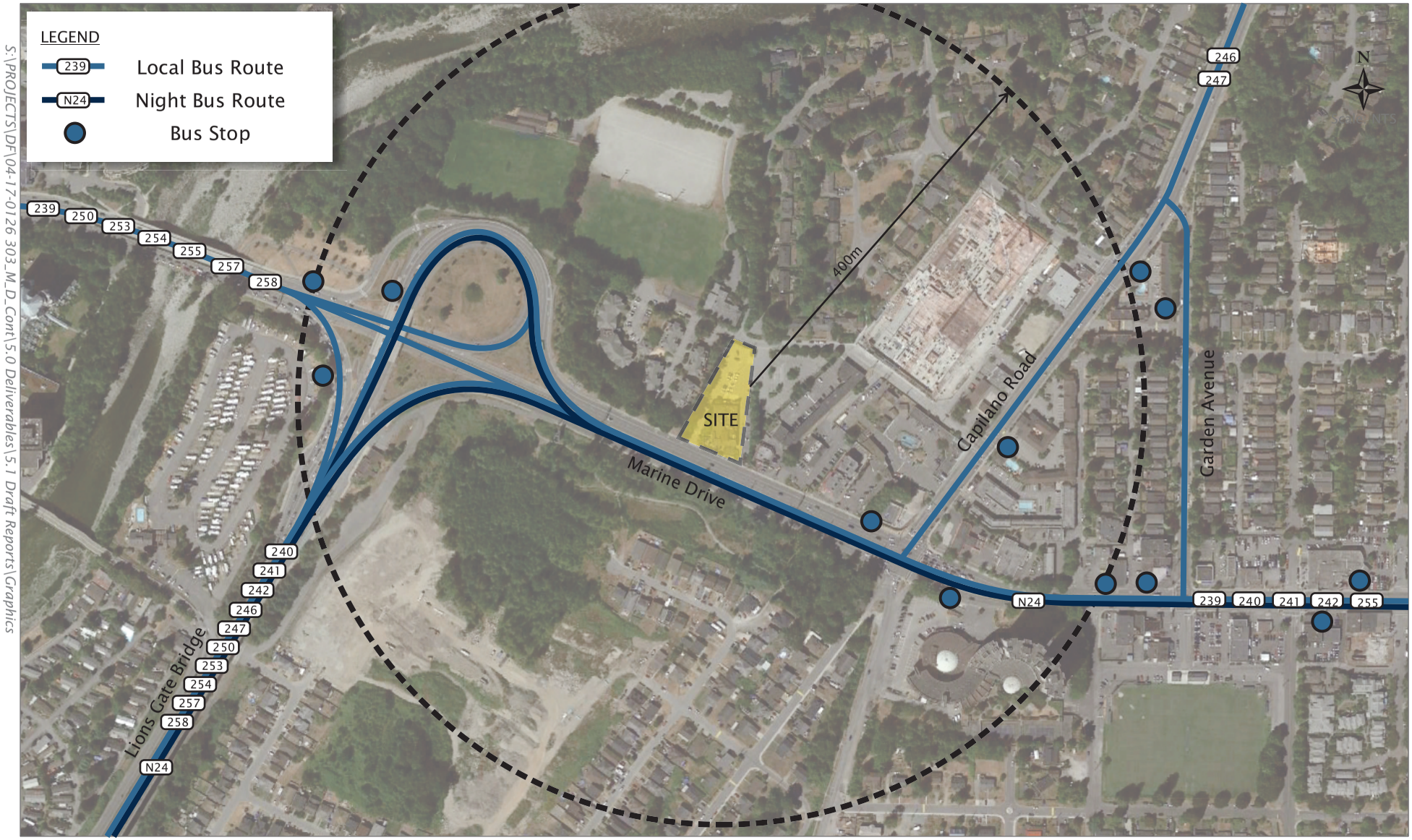

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Exhibit 2.2

Existing Transit Routes and Stops

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2.2.2 Cycling & Pedestrian Networks

Various classifications of bicycle routes are within close proximity within the development site. Marine Drive is classified as an on-street bicycle route with shared lane on a major street. It is used to connect North Vancouver with West Vancouver and provides the connection to the Lions Gate Bridge into Stanley Park and downtown Vancouver. Klahanie / Curling Road is also classified as an on-street bicycle route with signage throughout this local street. The Klahanie / Curling Road bicycle route connects with Fullerton Road to the north and continues as an on-street bicycle route. The bicycle route along Fullerton Road connects with the on-street painted bicycle lane on Capilano Road as it travels east. At this junction, the painted on-street bicycle routes travel along both the northbound and southbound directions of Capilano Road. The bicycle route along Capilano Road connects from Fullerton to W 23rd Avenue.

The site is located within a predominantly mixed-use commercial and residential community in the District of West Vancouver. This location is ideal for conducting daily services and provides good accessibility to various amenities within walking distance from the site. Within a 400m walking radius from the site, there are recreational uses, commercial uses, and restaurants.

Sidewalks are provided along both sides of most streets in the study area, and pedestrian push buttons and/or crosswalks are available at most major intersections.

2.3 Data Collection

2.3.1 Traffic Data Collection Program

To be consistent with other transportation impact assessment studies previously completed or underway in the study area, the existing traffic volumes were assumed to be the same as the Larco CapWest development traffic study and the Belle Isle Townhouse development traffic study.

For the Capilano corridor intersections, traffic and queue surveys were conducted on October 28, 2015 which was typical of a peak fall commuter season scenario. In the study area, peak hour traffic demands were observed to occur from 8:00 to 9:00 AM during the morning peak period and from 5:00 to 6:00 PM during the afternoon peak period.

Given these volumes were collected recently, and the changes in existing traffic volumes between 2015 and 2017 are likely very minor, Bunt used these 2015 volumes as the basis for existing traffic volumes in this study. To be consistent with the assumptions made for nearby developments, and explained further in Section 3.1.1, these 2015 volumes were growthed at 1% per year to bring them to 2017 volumes.

Exhibit 2.3 illustrates the current peak hour traffic volumes in the study area.

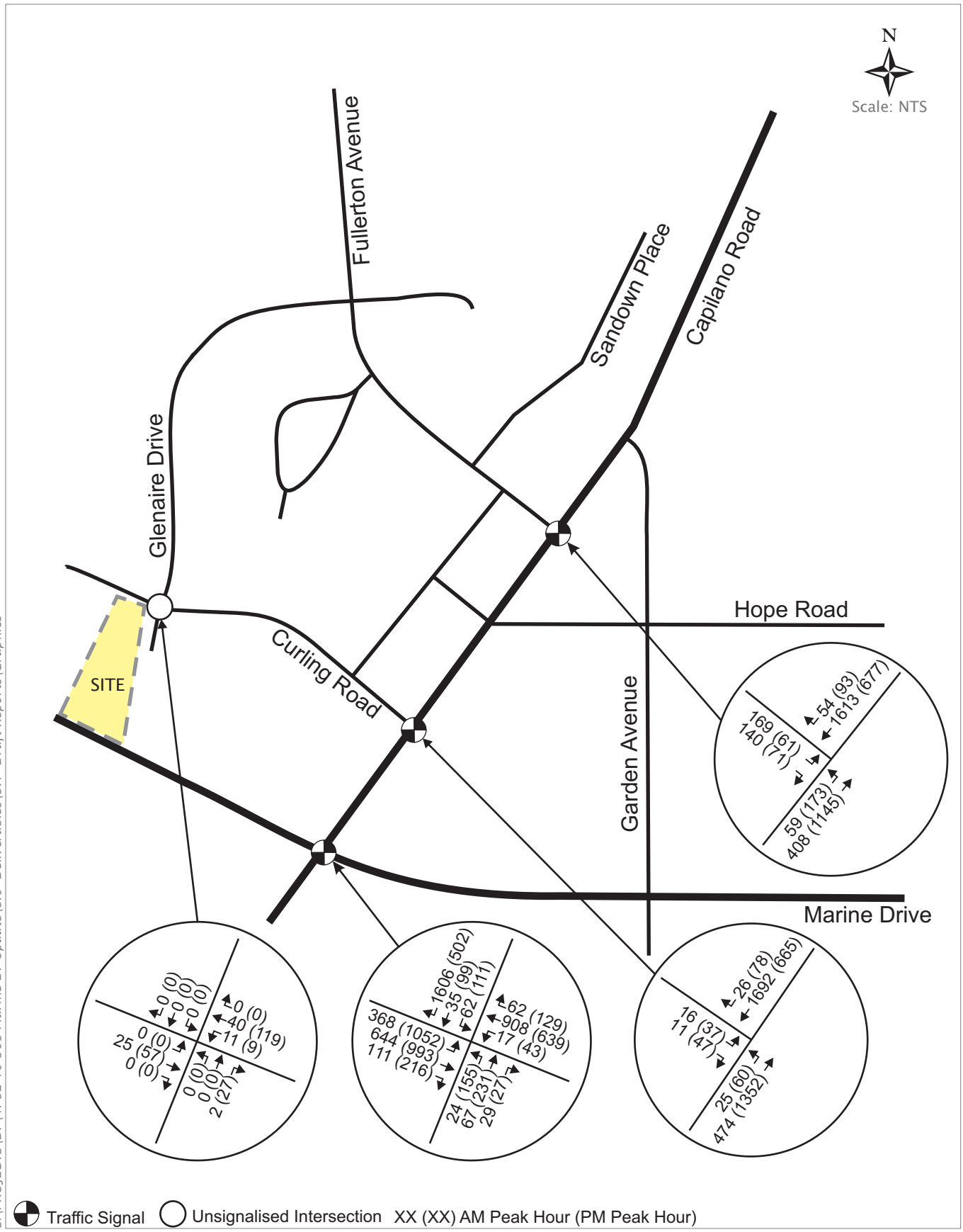

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Exhibit 2.3

Existing Peak Hour Traffic Volumes

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2.3.2 Existing Site Vehicle Trip Generation

Traffic counts were conducted at the accesses to the Earl's restaurant (one entry/exit access on Curling Road and one entry and one exit access on Marine Drive) in April of 2014 during the AM and PM peak hours. The AM peak hour flow counts were considered accurate, however, high flows were found during the PM peak hour along the Curling Road corridor. It was suspected that there may have been an extraordinary event at the Rugby club / baseball diamond northwest of the Earl's site which contributed to these high flows.

With that, spot counts (15 minutes) at the Earl's accesses were undertaken in June of 2014. The spot counts were undertaken between 3-6PM and only accounted for traffic volumes using the Earl's site. As this 15 minute counts may not been representative of the actual peak hour, the traffic counts were first multiplied by 4 to assume 60 minute flows. Thereafter, a 1.1 conservativeness factor was applied to these counts to ensure they were not underestimated. With the above, **Table 2.4** and **2.5** show the trips that were found to be generated at Earl's during the AM and PM peak hours.

Table 2.4 – Earl's Site Generated Volumes (Marine Drive)

AM PEAK HOUR			PM PEAK HOUR		
Traffic Volumes (per hour)			Traffic Volumes (per hour)		
In	Out	Total	In	Out	Total
3	0	3	5	22	27

Table 2.5 – Earl's Site Generated Volumes (Curling Road)

AM PEAK HOUR			PM PEAK HOUR		
Traffic Volumes (per hour)			Traffic Volumes (per hour)		
In	Out	Total	In	Out	Total
11	2	13	9	27	36

2.4 Existing Operations

2.4.1 Performance Thresholds

The existing operations of study area intersections and access points were assessed using the methods outlined in the 2000 Highway Capacity Manual (HCM), using the Synchro 9.1 analysis software (Build 904). The traffic operations were assessed using the performance measures of Level of Service (LOS) and volume-to-capacity (V/C) ratio.

The LOS rating is based on average vehicle delay and ranges from "A" to "F" based on the quality of operation at the intersection. LOS "A" represents optimal, minimal delay conditions, while a LOS "F" represents an over-capacity condition with considerable congestion and/or delay. Delay is calculated in seconds and is based on the average intersection delay per vehicle.

Table 2.6 below summarizes the LOS thresholds for the five Levels of Service, for both signalized and unsignalized intersections.

Table 2.6: Intersection Level of Service Thresholds

LEVEL OF SERVICE	AVERAGE CONTROL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Source: Highway Capacity Manual

The volume to capacity (V/C) ratio of an intersection represents the ratio between the demand volume and the available capacity. A V/C ratio less than 0.85 indicates that there is sufficient capacity to accommodate demands and generally represents reasonable traffic conditions in suburban settings. A V/C value between 0.85 and 0.95 indicates an intersection is approaching practical capacity; a V/C ratio over 0.95 indicates that traffic demands are close to exceeding the available capacity, resulting in saturated conditions. A V/C ratio over 1.0 indicates a very congested intersection where drivers may have to wait through several signal cycles. In downtown and Town Centre contexts, during peak demand periods, V/C ratios over 0.90 and even 1.0 are common.

The following desired traffic operations performance thresholds were assumed, which if exceeded would trigger consideration of potential mitigation measures:

- v/c = 0.90 or less for the overall intersection operations; and,
- v/c = 0.95 or less for individual movements and Levels of Service at E or F.

In interpreting the analysis results, note that the HCM methodology reports performance differently for various types of intersection traffic control. In this report, the performance reporting convention is as follows:

- For signalized intersections: HCM 2000 output for overall LOS and V/C as well as individual movement LOS and V/C is reported. 50th and 95th Percentile Queues are reported as estimated by both Synchro and SimTraffic, the micro-simulation module of the Synchro software;
- For unsignalized two-way stop controlled intersections: HCM 2000 LOS and V/C output is reported just for individual lanes as the HCM methodology does not report overall performance. SimTraffic estimated queues have also been reported, as the HCM 2000 methodology does not directly take into account the gaps afforded by adjacent signalized intersections;

The performance reporting conventions noted above have been consistently applied throughout this document and the detailed outputs are provided in **Appendix B**.

2.4.2 Existing Conditions Analysis Assumptions

Signal Timing:

Since the traffic and queues surveys Bunt previously conducted in October 2015, a signal at the intersection of Curling Road and Capilano Road has been installed. With this new traffic signal, it was assumed that the signal timing and coordination for the three Capilano corridor intersections (Marine Drive, Curling Road, and Fullerton Avenue) was updated to reflect the recommendations in previous Bunt TIA's. Therefore, the signal timings assumed in this 2017 existing conditions analysis do not reflect the signal timing when the volumes were collected in 2015 but reflect Bunt's signal timings recommended to the District of North Vancouver upon signalization the Curling Road and Capilano Road intersection.

While the installation of traffic signals may have an effect on traffic volumes, given none of the developments planned on the west side of Curling Road have yet to be constructed and occupied, the volumes collected in 2015 before the installation of the signal are considered valid.

2.4.3 Existing Operational Analysis Results

Fullerton Avenue / Capilano Road

Tables 2.7 and **2.8** summarize the reported HCM 2000 performance of Fullerton Avenue / Capilano Road with the Synchro and SimTraffic (ST) queues in the AM and PM Peak hours, respectively. It can be seen that the reported overall operations of this intersection were acceptable in both the AM and PM peak. It must be noted that the southbound through movement exhibits near or at-capacity v/c for the AM peak.

Table 2.7: Fullerton Avenue / Capilano Road – AM Peak Hour – 2017 Existing Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
EXISTING 2015						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.55	0.10	0.28	0.19	**0.96**	
Delay (s)	26	22	33	1	29	
LOS	C	C	C	A	C	
50th Queue (m)	20	0	4	3	115	
ST Average Queue (m)	28	22	12	6	92	
95th Queue (m)	34	12	11	4	188	
ST 95th Queue (m)	44	38	23	17	168	
INTERSECTION V/C:		*0.81*	*INTERSECTION LOS (DELAY):*		*C (24)*	

Table 2.8: Fullerton Avenue / Capilano Road – PM Peak Hour – 2017 Existing Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
EXISTING 2015						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.36	0.05	0.35	0.48	0.43	
Delay (s)	28	26	4	5	9	
LOS	C	C	A	A	A	
50th Queue (m)	8	0	6	31	28	
ST Average Queue (m)	13	10	20	37	34	
95th Queue (m)	17	10	15	49	48	
ST 95th Queue (m)	24	19	39	66	59	
INTERSECTION V/C:		*0.50*	*INTERSECTION LOS (DELAY):*		*A (8)*	

Curling Road / Capilano Road

Tables 2.9 and **2.10** summarize the reported HCM 2000 performance of the Curling Road / Capilano Road intersection with the Synchro and SimTraffic (ST) queue in the AM and PM peak hours, respectively. The west leg of the intersection was assumed to have a shared left/right lane. The intersection operates within performance thresholds in existing conditions. The eastbound direction does experience high delays and LOS 'E' in the AM peak due to the 130 second cycle length that is required to maintain good through movement coordination with the nearby Marine Drive / Capilano Road intersection.

Table 2.9: Curling Road/ Capilano Road – AM Peak Hour – 2017 Existing Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
EXISTING 2015						
Geometry	L/R		L-T-T		T-T/R	
v/c	0.19		0.16	0.16	0.60	
Delay (s)	60		5	1	5	
LOS	E		A	A	A	
50th Queue (m)	4		1	6	34	
ST Average Queue (m)	8		5	3	42	
95th Queue (m)	14		m4	9	m70	
ST 95th Queue (m)	19		13	12	76	
INTERSECTION V/C:	*0.57*		*INTERSECTION LOS (DELAY):*		*A (5)*	

Table 2.10: Curling Road / Capilano Road – PM Peak Hour – 2017 Existing Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
EXISTING 2015						
Geometry	L/R		L-T-T		T-T/R	
v/c	0.24		0.13	0.56	0.36	
Delay (s)	27		1	4	4	
LOS	C		A	A	A	
50th Queue (m)	5		1	11	12	
ST Average Queue (m)	13		9	26	29	
95th Queue (m)	15		m2	27	19	
ST 95th Queue (m)	24		20	46	66	
INTERSECTION V/C:	*0.55*		*INTERSECTION LOS (DELAY):*		*A (5)*	

Marine Drive / Capilano Road

Tables 2.11 and **2.12** summarize the reported HCM 2000 performance of the Marine Drive / Capilano Road intersection with the Synchro and SimTraffic (ST) queue in the AM and PM peak hours, respectively.

The intersection is close to capacity in the AM peak hour with an overall intersection v/c of 0.91. The southbound right is the worst performing with a v/c of 0.90 and long queues extending up Capilano Road. The westbound left was shown to operate at LOS 'F' but this is primarily a result of the long 130 second cycle; as this left turn movement has low demand (less than 20vph), the high delays are not considered a significant operational issue for the intersection.

In the PM peak, the shared southbound through/left turn operates with a LOS 'E' and v/c ratio of 0.96. This is because the southbound through and left turn movements share a single lane in existing conditions and left turn vehicles do not have a protected phase.

Table 2.11: Marine Drive / Capilano Road – AM Peak Hour – 2017 Existing Conditions

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
EXISTING 2015												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.67	0.50	0.08	0.57	0.75	0.05	0.04	0.08	0.02	0.15		**0.90**
Delay (s)	59	31	26	82	47	36	19	19	0	22		18
LOS	E	C	C	**F**	D	D	B	B	A	C		B
50th Queue (m)	47	63	0	4	85	0	3	9	0	14		97
ST Average Q (m)	39	46	8	7	116	30	12	10	0	24		77
95th Queue (m)	62	93	12	12	101	0	8	18	0	25		100
ST 95th Queue (m)	57	68	28	30	150	60	34	21	0	62		111
INTERSECTION V/C: ***0.91***							*INTERSECTION LOS (DELAY):* *C (31)*					

Table 2.12: Marine Drive / Capilano Road – PM Peak Hour – 2017 Existing Conditions

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
BACKGROUND 2030												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.72	0.57	0.18	0.53	0.74	0.18	0.81	0.53	0.02	**0.96**		0.28
Delay (s)	35	20	15	65	52	44	66	43	0	80		6
LOS	C	B	B	E	D	D	E	D	A	E		A
50th Queue (m)	128	102	6	12	64	5	41	56	0	44		11
ST Average Q (m)	100	63	29	29	65	31	38	40	5	51		29
95th Queue (m)	160	133	21	25	79	23	70	79	0	95		31
ST 95th Queue (m)	151	100	73	26	111	56	69	68	26	82		80
INTERSECTION V/C: 0.82							*INTERSECTION LOS (DELAY): C (34)*					

3. FUTURE TRAFFIC CONDITIONS

3.1 Traffic Forecasts

3.1.1 Background Traffic Forecasts

There will be two components associated with "background" or non-site traffic growth in the future: general background growth associated with vehicles driving through the study area, and site-specific background growth associated with known development sites in the study area (that have trip origins and destinations located in the study area).

General Background Growth

To be consistent with previous neighbourhood planning work and other TIAs in the study area, Bunt assumed a 1% blanket (compound) growth rate for both AM and PM peak hour background traffic growth, to forecast the 2020 Background and 2030 Background traffic volumes.

The exceptions to this blanket growth rate application were the movements to/from the Lions Gate Bridge which in our view are at saturation levels in the morning peak period. Consequently, no growth in background traffic was assumed for the AM Peak Hour only at the Marine Drive & Capilano intersection, for the southbound right turn and the westbound through movements and for the PM Peak only at the Marine Drive & Capilano intersection, for the eastbound left turn movement. For these movements, on-site observations during our count program indicated they are saturated and therefore additional traffic volumes could not be processed through the intersection. As side note, growth was applied only to the through volumes for the Capilano Road corridor so not to double count growth from the side streets.

Site Specific Background Growth

In addition to the application of blanket background growth, Bunt superimposed forecasted background traffic from the known developments in the area. For the 2020 Opening Day scenario, the following developments were assumed to be constructed:

- Larco CapWest;
- Pacific Gate Grouse Inn;
- Lions Gate Peripheral Area Townhouse Development; and,
- 2050-2070 Marine Drive.

For the 2030 Planning Horizon, in addition to the developments noted above, the proposed hotel development at 1634-1768 Capliano Road was assumed to be constructed.

For this TIA, the site land uses, density, and unit mixes for these other developments was assumed to be consistent with the latest available information from these other developers; as the site plans for these

other projects are still being developed and refined, the final site statistics may be somewhat different than assumed in this study but is not anticipated to drastically affect traffic operations. As the TIA for the 2050-2070 Marine Drive development is still being completed by the developer's traffic consultant, Bunt was unable to retrieve the assumed trip generation or site statistics for that development. Instead, a conservative assumption was made on the number of units and resulting trip generation based on the publically available information regarding the number of storeys. Trip generation for the other nearby developments were based on a combination of trip rates within the CTS Lower Capilano Marine Village Centre Transport Plan Study and ITE Trip Generation Manual (9th Edition), as agreed upon with District of North Vancouver staff. **Exhibit 3.1** and **3.2** summarize the combined vehicle trip generation of the surrounding developments noted above for the Opening Day and Opening Day + 10 horizon years, respectively.

Exhibit 3.3 and **3.4** summarize the background traffic forecasts for the Opening Day and Opening Day + 10 horizon years which include both the general background growth and the nearby site specific growth as highlighted in Exhibit 3.1 and 3.2

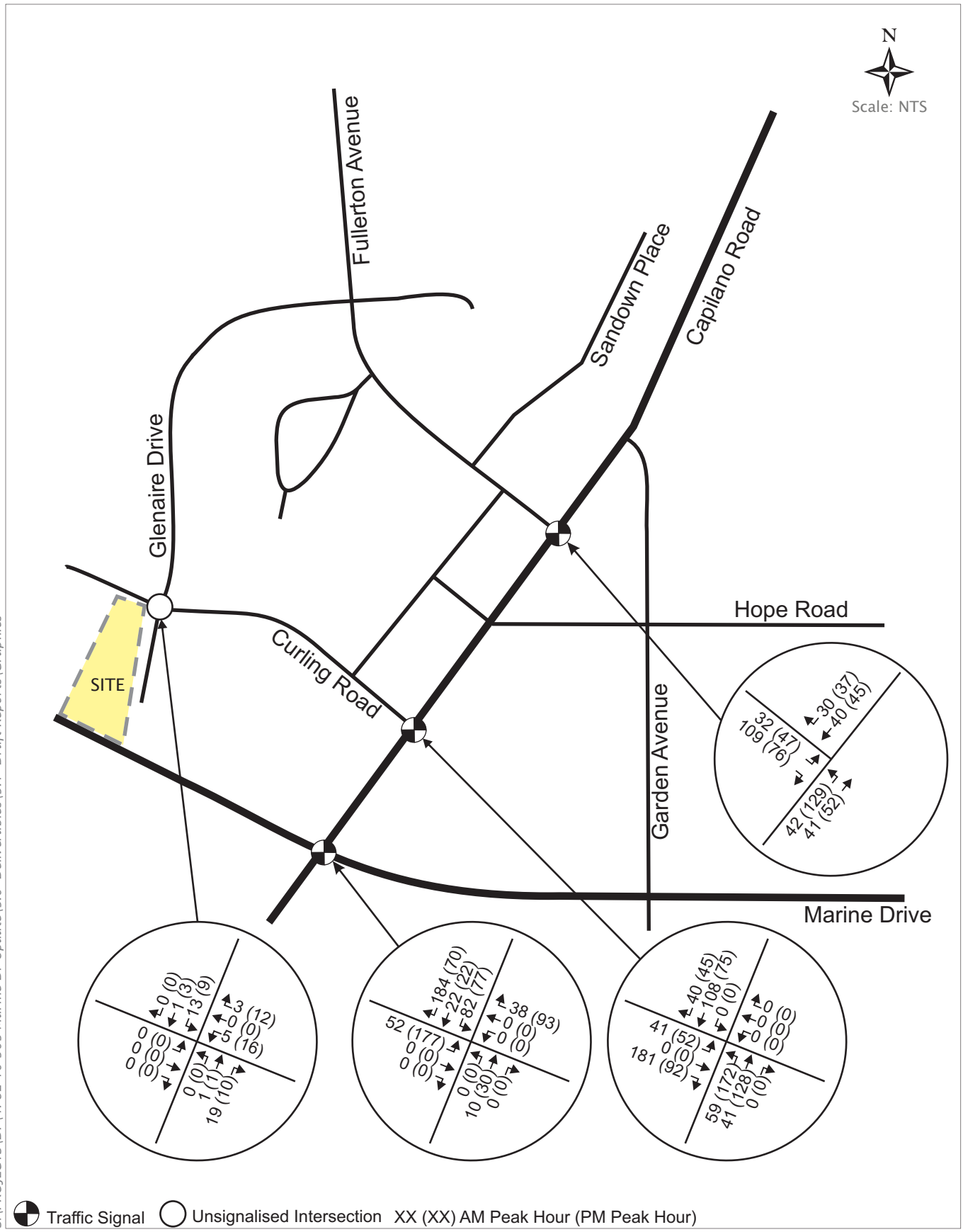

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Exhibit 3.1

Opening Day (2020) Nearby Development Traffic Forecasts

303 Marine Drive Update

04-17-0126 April 2018

bunt & associates

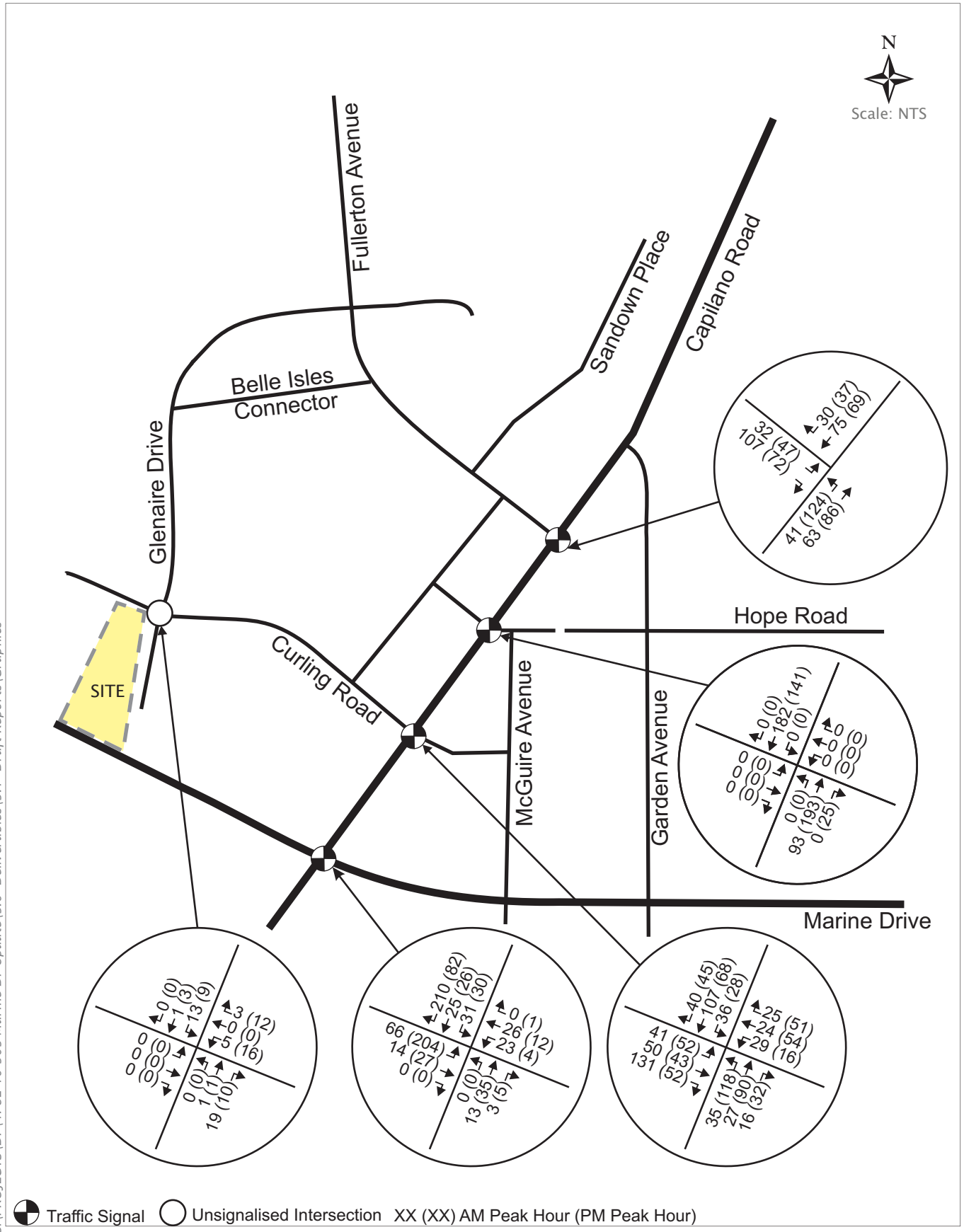

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Exhibit 3.2

Opening Day (2030) Nearby Development Traffic Forecasts

303 Marine Drive Update

04-17-0216 April 2018

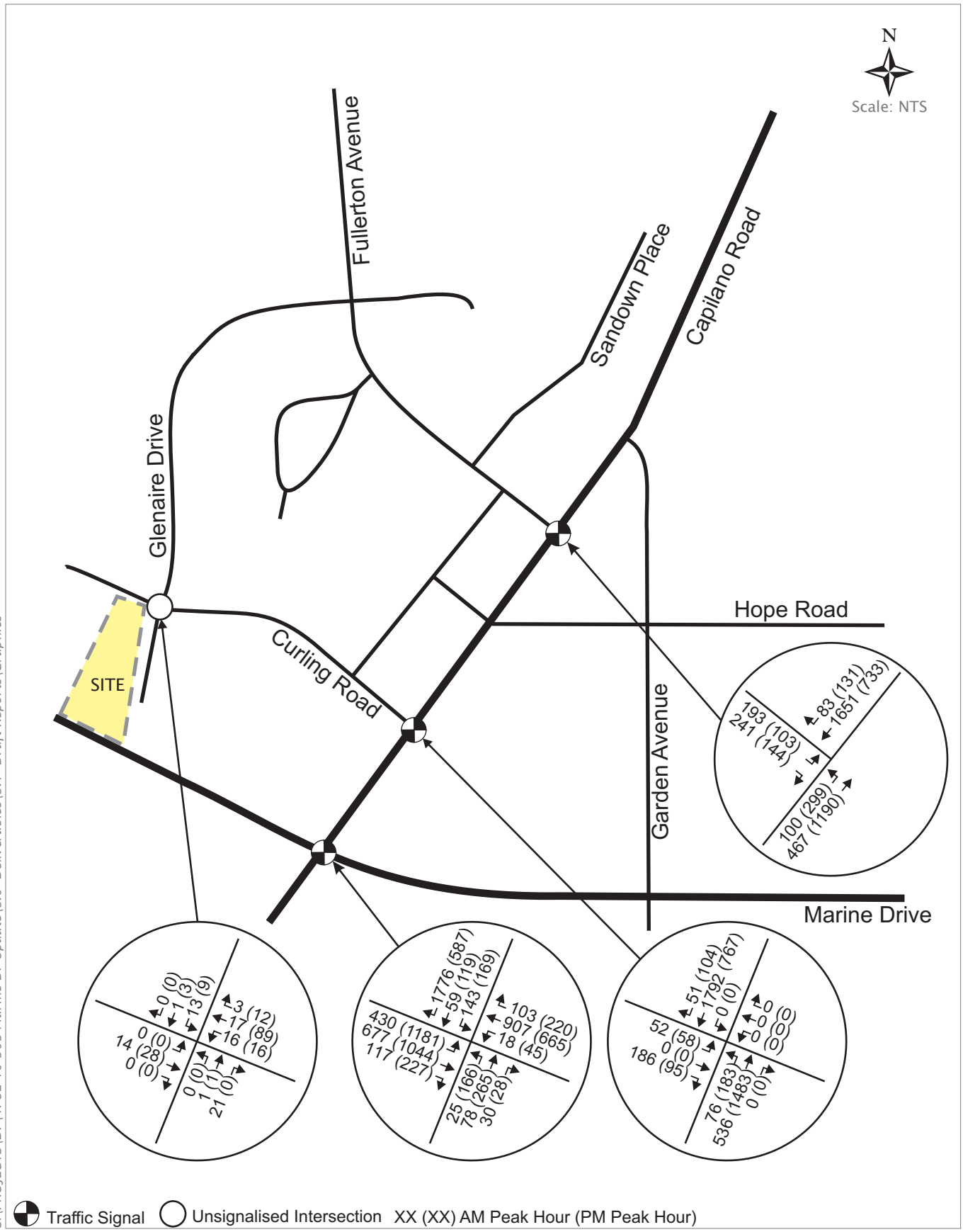

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Exhibit 3.3

Opening Day (2020) Background Traffic Forecasts

bunt & associates

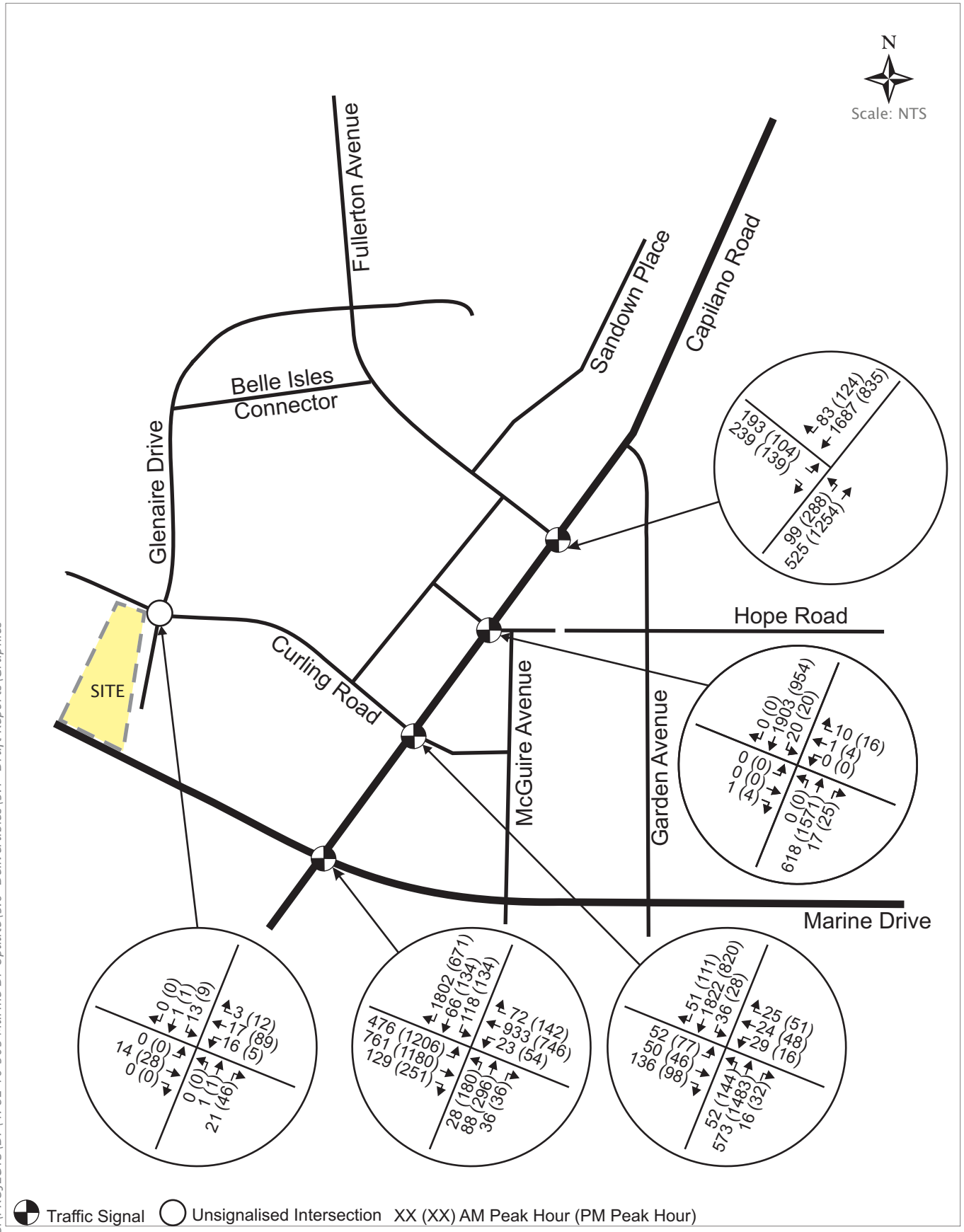

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Exhibit 3.4

Opening Day + 10 (2030) Background Traffic Forecasts

3.1.2 Site Traffic

Trip Generation

Similar to the nearby developments, the site trip generation for the proposed development was prepared using a combination of trip rates within the CTS Lower Capilano Marine Village Centre Transport Plan Study and ITE Trip Generation Manual (9th Edition). **Table 3.1** below summarizes the peak hour vehicle trip rates for the development.

Table 3.1: Peak Hour Vehicle Trip Rates

LAND USE	UNITS	SOURCE	AM PEAK HOUR			PM PEAK HOUR		
			IN	OUT	TOTAL	IN	OUT	TOTAL
High-Rise Residential	129	CTS	0.04	0.16	0.20	0.14	0.08	0.22
Townhouses	4	Bunt / ITE[1]	0.07	0.37	0.44	0.35	0.17	0.52

[1] Townhouse trip generation rates were derived from a recent Bunt study of two townhouse developments near to the site: specifically, Cedar Crescent located at 2871-2935 Capilano Road and 3401-3599 Capilano Road. Driveway counts at these two existing townhouse sites were undertaken in late February 2016 and the resulting trip generation rates were found to be very close to the Residential Condominium / Townhouse category (ITE 230) within the ITE Trip Generation Manual (9th Edition). Therefore, the ITE 230 was used for analysis purposes in this TIA.

Table 3.2 summarizes the anticipated future site generated vehicle trips for the proposed development based on the above rates.

Table 3.2: Estimated Peak Hour Site Vehicle Trips

LAND USE	UNITS	AM PEAK HOUR			PM PEAK HOUR		
		IN	OUT	TOTAL	IN	OUT	TOTAL
High-Rise Residential	129[1]	5	21	26	18	10	28
Townhouses	4	0	2	2	1	1	2
TOTAL	**121**	**5**	**23**	**28**	**19**	**11**	**30**

[1] The site trips calculated in the table are slightly different than the site trips modelled. The traffic operations were conducted assuming a previous iteration of the site plan with a total of 121 units. However, as the change in trips between 121 and 134 units is less than 5 trips in the busiest peak period, the difference is negligible from an operations standpoint and the analysis was not updated.

Trip Distribution & Assignment

The site traffic distribution was assumed to roughly match the existing observed splits at the study area intersections, and the AM / PM peak hour distributions match those assumed by CTS for the Lower Capilano Transportation Plan study. **Table 3.4** summarizes the assumed distributions for the new site traffic.

Table 3.3: Estimated Trip Distribution

ORGIN/DESTINATION	AM PEAK HOUR		PM PEAK HOUR	
	IN (%)	OUT (%)	IN (%)	OUT (%)
Capilano (North)	40%	20%	21%	37%
Hope (East)	1%	1%	1%	1%
Marine (East)	23%	23%	25%	29%
Capilano (South)	6%	6%	8%	7%
Marine (West)	30%	50%	46%	26%
TOTAL	100%	100%	100%	100%

Applying these distributions to the site traffic volumes, the estimated development site traffic on the study area road network is shown on **Exhibit 3.5** for the Opening Day (2020) and on **Exhibit 3.6** for the Opening Day +10 (2030), with the McGuire Avenue connections east of Capilano Road in place.

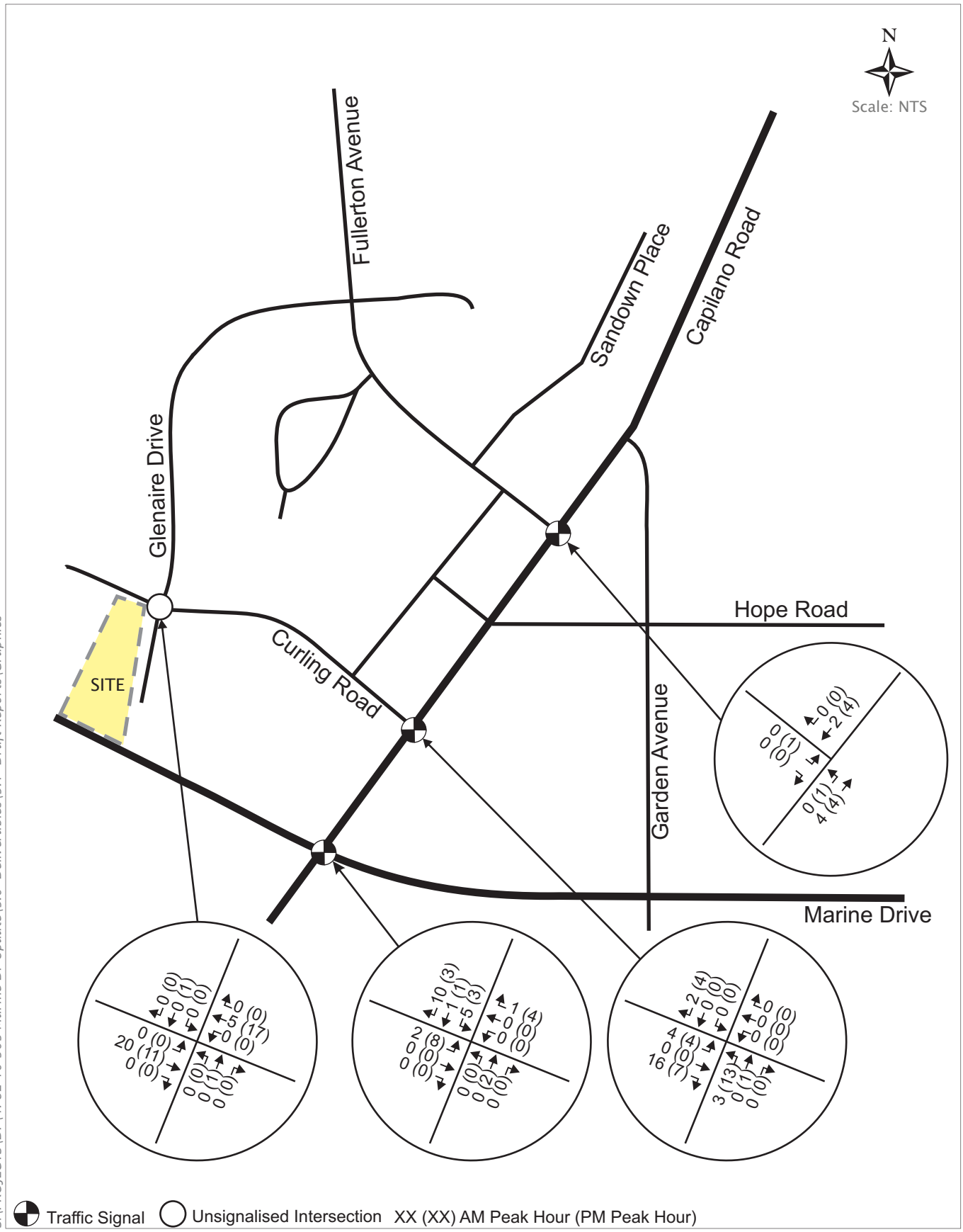

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Exhibit 3.5

Site Traffic (2020) Traffic Forecasts

303 Marine Drive Update
04-17-0127 April 2018

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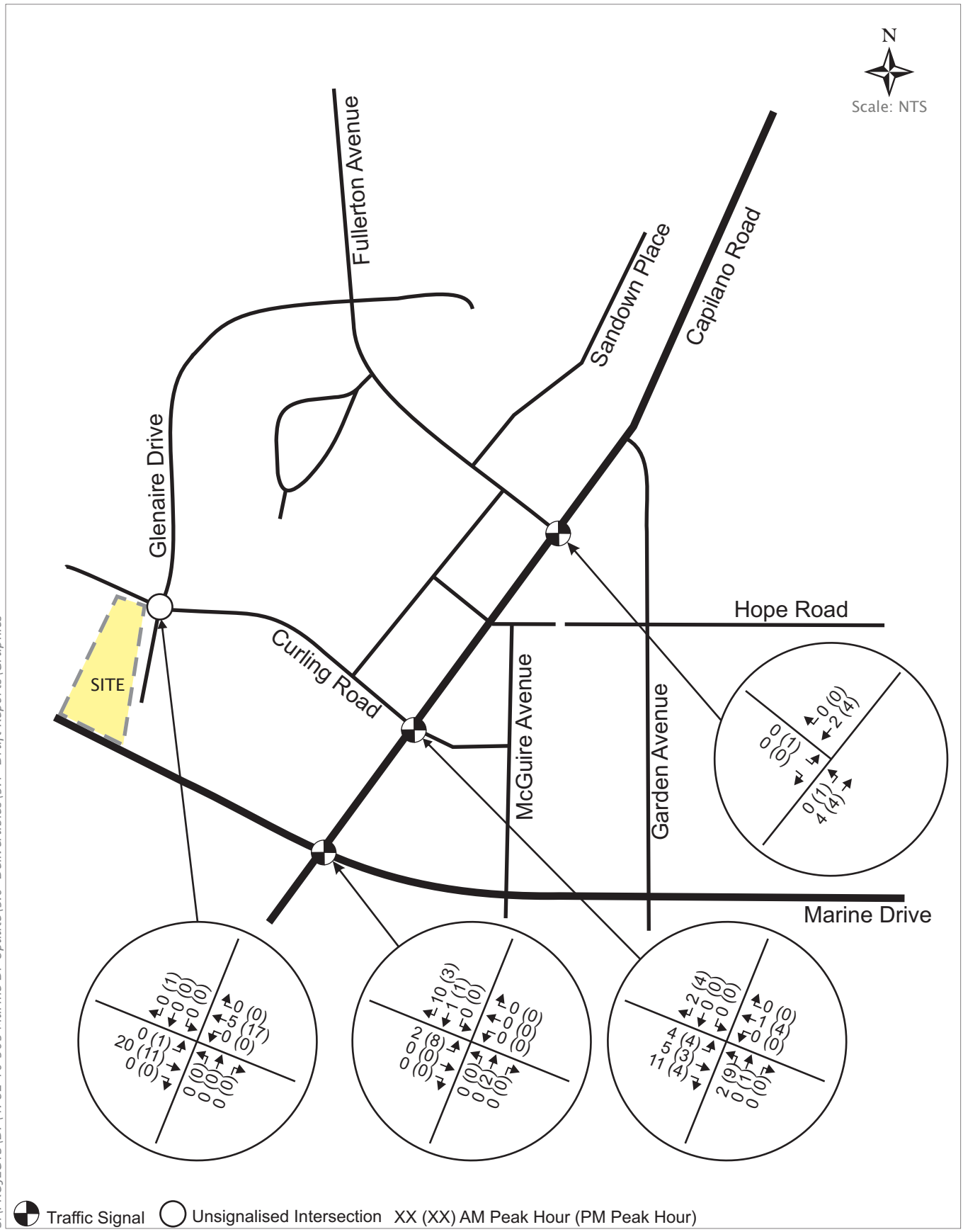

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Exhibit 3.6

Site Traffic (2030) Traffic Forecasts

303 Marine Drive Update
04-17-0126 April 2018

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3.1.1 Total Traffic

The total traffic on the study area road network was forecasted by combining background traffic volumes and the estimated new site trips. **Exhibit 3.7** illustrates Total Opening Day (2020) forecasts and **Exhibit 3.8** illustrate Total Opening Day +10 Years (2030) traffic forecasts.

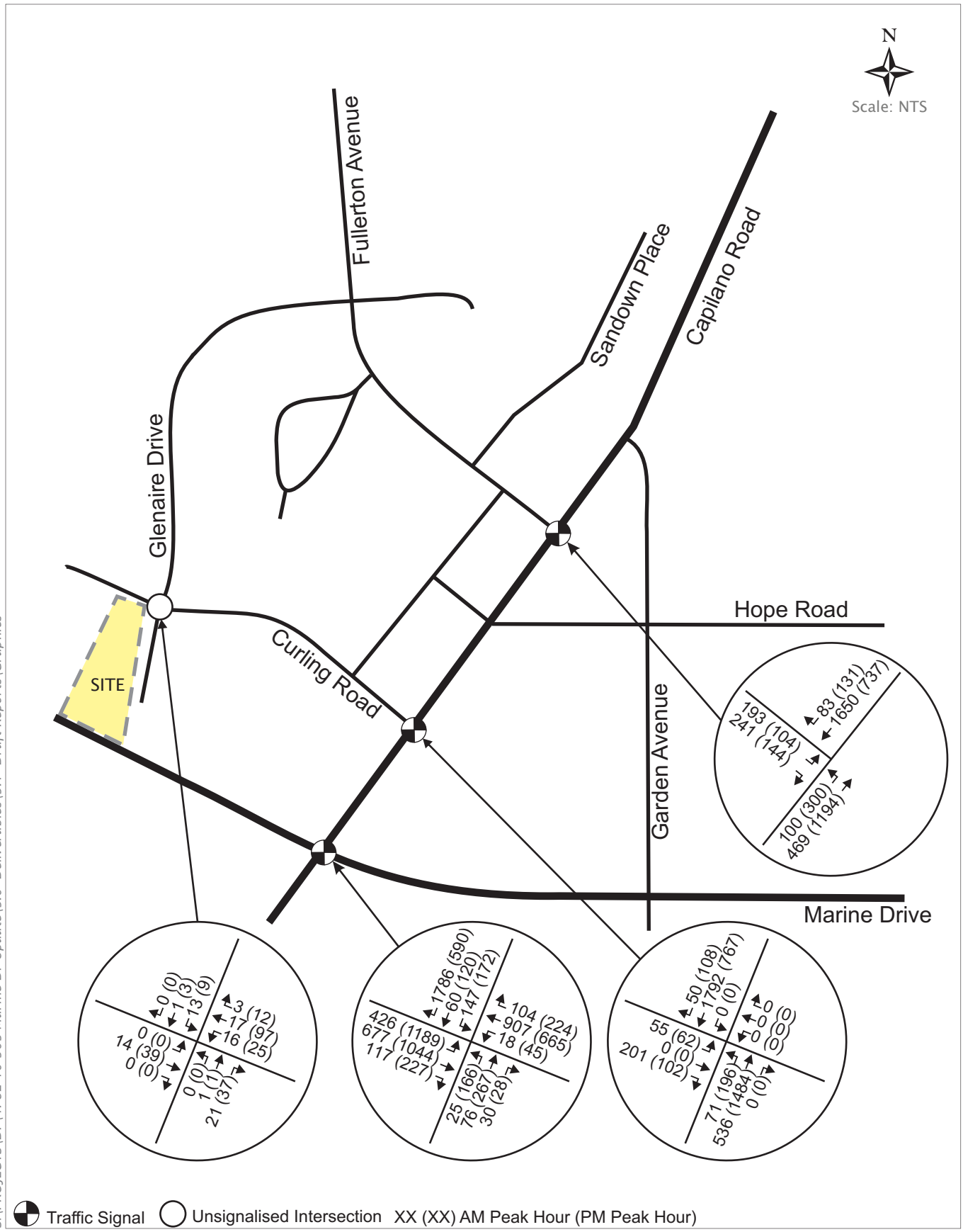

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Exhibit 3.7

Opening Day (2020) Total Traffic Forecasts

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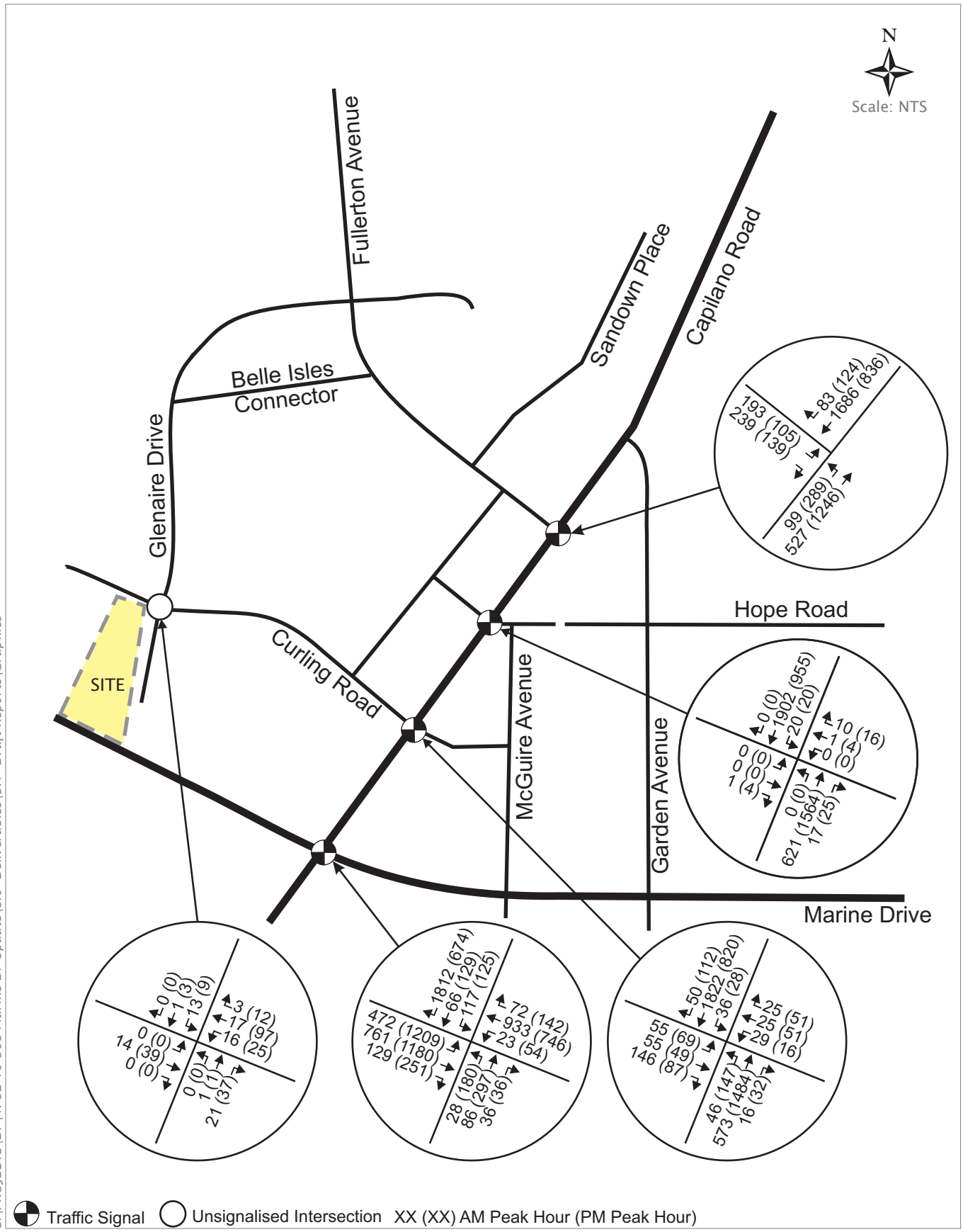

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Exhibit 3.8

Opening Day + 10 (2030) Total Traffic Forecasts

3.2 Future Traffic Operations

3.2.1 Future Conditions Analysis Assumptions

Road Network and Intersection Control

For the purposes of analysis, road network and intersection control assumptions for Opening Day 2020 were:

- The future McGuire Road Connection will not yet be completed;
- The intersection of Curling Road / Capilano Road is signalized;
- The west leg of Curling Road / Capilano Road has separate right and left turn bays;
- Curling Road would not yet be connected to McGuire Road past the Capilano Road corridor;
- The future new separate southbound to eastbound left turn lane on Capilano Road to Marine Drive will be in place (part of the Pacific Gate Grouse Inn off-site improvement); and,
- Glenaire Drive will be connected to Curling Road (part of the Lions Gate Peripheral Area townhouse developments off-site improvements).

In addition to these Opening Day assumptions, the following assumptions were made for the Opening Day + 10 (2030) horizon year:

- McGuire Avenue will be extended and completed between Marine Drive and the Woonerf;
- New traffic signal at Capilano Road / McGuire Avenue;
- Curling Road will be extended to the east and connected to McGuire Avenue; and,
- Both the east and west legs of the Curling Road / Capilano intersection have a shared through/right lane plus left turn bay configuration.

Signal Timing

With the recent installation of the Curling Road / Capilano Road intersection, the three traffic signals at Marine Drive, Curling Road, and Fullerton Avenue were coordinated as reported in *Bunt's CapWest Transportation Impact Assessment Study at Full Build Out* Today.

In consequence, for this TIA Bunt assumed that for the Opening Day 2020 the intersection signal timings at Marine Drive, Curling Road, and Fullerton Avenue were coordinated and phasing/green splits optimized. However, the signal phase split optimization was updated to accommodate the new forecasted traffic which is anticipated to be higher than in the CapWest study.

A summary of the assumed signal timings is shown in **Table 3.4** . Note, for this analysis, the yellow and all red clearance times for the new Capilano Road / Curling Road intersection were not the Synchro-calculated defaults but were calculated based on District of North Vancouver guidelines[1]. For the purposes

[1] District of North Vancouver Signal Timing Practices Review, CTS, 2002

of this TIA, the yellow and all red clearance times at the existing Marine Drive and Fullerton signals were assumed to be the same as today, since stop bars and curb locations at these existing signalized intersections are not expected to change.

Table 3.4: Signal Timing Assumptions – 2020 Background / Total Conditions

INTERSECTION	2020 BACKGROUND / TOTAL	
	AM PEAK HOUR	PM PEAK HOUR
Fullerton Avenue / Capilano Road	Optimized Timing, Coordinated (65s Cycle)	Optimized Timing, Coordinated (65s Cycle)
Curling Road / Capilano Road	Optimized Timing Coordinated (130s Cycle)	Optimized Timing, Coordinated (65s Cycle)
Marine Drive / Capilano Road	Optimized Timing, Coordinated (130s Cycle)	Optimized Timing, Coordinated (130s Cycle)

For the 2020 Total conditions, it was assumed that the Capilano Corridor signal cycle lengths and coordination offsets would not change from the 2020 Background conditions. As such, only signal phase optimization of green splits was assumed to accommodate additional site trip volumes anticipated in the study area.

"Half cycling" at the Fullerton Avenue intersection as noted in the table above was assumed during both the AM and PM peak hours, and similarly at the Curling Road intersection during the PM peak hour. The longer cycle time at Curling Road of 130 seconds during the AM Peak Hour was assumed in order to provide better coordination with the critical southbound right turn onto Marine Drive. In Bunt's view, this is considered the best approach to provide opportunities for side street vehicles to enter the Capilano Road corridor without excessive queues blocking the future "Woonerf" road and ensuring northbound to westbound left turn bays do not overflow on Capilano Road. The efficiency of intersection operations may be somewhat worsened as compared to a providing a longer cycle as there is more lost time with double cycling. Also, operations for major arterial movements may not be optimized; however, it is Bunt's opinion that double cycling is necessary to support the densities proposed for the Lower Capilano Marine Village plan and that it balances the need to manage queues as well as provide good traffic operations for through traffic.

By 2030, improvements to the Capilano Corridor anticipated as outlined earlier within this section. Based on the above improvements and to optimize operations while managing queues, **Table 3.2** summarizes the proposed cycle lengths for each intersection. As McGuire Avenue will be signalized and is located between Fullerton and Curling Road, the cycle length is recommended to be 65 seconds for the best coordination with other signals in the corridor.

Table 3.5: Signal Timing Assumptions – 2030 Background / Total Conditions

INTERSECTION	2030 BACKGROUND / TOTAL	
	AM PEAK HOUR	PM PEAK HOUR
Fullerton Avenue / Capilano Road	Optimized Timing, Coordinated (65s Cycle)	Optimized Timing, Coordinated (65s Cycle)
McGuire Avenue / Capilano Road	Optimized Timing, Coordinated (65s Cycle)	Optimized Timing, Coordinated (65s Cycle)
Curling Road / Capilano Road	Optimized Timing Coordinated (130s Cycle)	Optimized Timing, Coordinated (65s Cycle)
Marine Drive / Capilano Road	Optimized Timing, Coordinated (130s Cycle)	Optimized Timing, Coordinated (130s Cycle)

3.2.1 Future Background and Total Traffic Operations

Traffic operations were analyzed using the Synchro/SimTraffic software; the results are summarized in a series of tables provided in the sections below as well as Appendix B.

The summary tables report the calculated Volume-to-Capacity (v/c) ratio and a corresponding delay-based traffic Level of Service (LOS) indicator ranging from LOS A conditions with minimal delay through to LOS E 'near capacity' conditions and LOS F 'over-saturated' conditions when drivers may have to wait through several signal cycles to perform their desired movements through the intersection. The 50th and 95th percentile queues, which are predicted queue lengths for each lane group, are also summarized measured in metres.

Note, given the net new site trips are expected to minimal, the operations between the Background and Total scenarios is very similar.

Fullerton Avenue / Capilano Road

Tables 3.6 to **3.9** summarize the reported HCM 2000 performance of Fullerton Avenue / Capilano Road with the Synchro and SimTraffic (ST) queues in the AM and PM Peak hours, respectively. It can be seen that the reported overall operations of this intersection were acceptable in all scenarios. It must be noted that the southbound through movement exhibits near or at-capacity v/c for all of the AM scenarios. This is consistent with the existing roadway conditions.

Table 3.6: Fullerton Avenue / Capilano Road – AM Peak Hour – 2020 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.57	0.32	0.38	0.22	**1.04**	
Delay (s)	26	23	44	3	51	
LOS	C	C	D	A	D	
50th Queue (m)	22	6	8	8	132	
ST Average Queue (m)	33	30	19	10	296	
95th Queue (m)	36	21	22	12	197	
ST 95th Queue (m)	42	39	30	16	301	
Intersection V/C:		*0.85*	*Intersection LOS (Delay):*			*D (38)*
TOTAL 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.57	0.32	0.39	0.22	**1.04**	
Delay (s)	26	23	44	3	51	
LOS	C	C	D	A	D	
50th Queue (m)	22	6	8	2	132	
ST Average Queue (m)	32	29	19	12	296	
95th Queue (m)	36	21	14	11	197	
ST 95th Queue (m)	52	43	41	24	302	
Intersection V/C:		*0.85*	*Intersection LOS (Delay):*			*D (38)*

Table 3.7: Fullerton Avenue / Capilano Road – PM Peak Hour – 2020 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.41	0.10	0.56	0.52	0.64	
Delay (s)	26	24	17	9	18	
LOS	C	C	B	A	B	
50th Queue (m)	12	0	41	91	41	
ST Average Queue (m)	19	18	39	53	56	
95th Queue (m)	23	13	55	85	65	
ST 95th Queue (m)	35	33	63	85	156	
Intersection V/C:		*0.57*	*Intersection LOS (Delay):*			*B (14)*
TOTAL 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.41	0.10	0.57	0.52	0.64	
Delay (s)	26	24	17	9	18	
LOS	C	C	B	A	B	
50th Queue (m)	12	0	42	91	42	
ST Average Queue (m)	19	18	42	55	72	
95th Queue (m)	23	13	57	85	66	
ST 95th Queue (m)	36	32	64	83	154	
Intersection V/C:		*0.58*	*Intersection LOS (Delay):*			*B (14)*

Table 3.8: Fullerton Avenue / Capilano Road – AM Peak Hour – 2030 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2030						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.57	0.32	0.38	0.24	**1.07**	
Delay (s)	26	23	42	1	58	
LOS	C	C	D	A	E	
50th Queue (m)	22	6	8	3	137	
ST Average Queue (m)	30	28	17	9	303	
95th Queue (m)	36	21	21	4	203	
ST 95th Queue (m)	48	41	31	20	321	
Intersection V/C:		*0.86*	*Intersection LOS (Delay):*			*D (42)*
TOTAL 2030						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.58	0.32	0.38	0.25	**1.07**	
Delay (s)	26	23	41	2	60	
LOS	C	C	D	A	E	
50th Queue (m)	22	6	8	3	138	
ST Average Queue (m)	30	28	17	14	302	
95th Queue (m)	36	21	22	4	203	
ST 95th Queue (m)	51	42	29	24	323	
Intersection V/C:		*0.87*	*Intersection LOS (Delay):*			*D (43)*

Table 3.9: Fullerton Avenue / Capilano Road – PM Peak Hour – 2030 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2030						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.48	0.09	0.56	0.53	0.67	
Delay (s)	28	25	15	8	18	
LOS	C	C	B	A	B	
50th Queue (m)	12	0	37	95	49	
ST Average Queue (m)	20	17	48	63	61	
95th Queue (m)	24	14	45	70	76	
ST 95th Queue (m)	38	32	67	86	79	
Intersection V/C:		*0.61*	*Intersection LOS (Delay):*			*B (14)*
TOTAL 2030						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.48	0.09	0.56	0.53	0.67	
Delay (s)	28	25	15	8	18	
LOS	C	C	B	A	B	
50th Queue (m)	12	0	37	95	49	
ST Average Queue (m)	21	18	45	61	62	
95th Queue (m)	24	14	45	70	76	
ST 95th Queue (m)	41	33	65	74	81	
Intersection V/C:		*0.61*	*Intersection LOS (Delay):*			*B (14)*

Curling Road / Capilano Road

Tables 3.10 to **3.13** summarize the reported HCM 2000 performance of Curling Road / Capilano Road intersection with the Synchro and SimTraffic (ST) queue in the AM and PM Peak hours, respectively. For the purposes of analysis under 2020 traffic demands, Curling Road was assumed to have separate right and left turn exit lanes.

By 2030, with Curling extended eastward to McGuire, the eastbound approach on Curling was assumed to be changed to an eastbound left turn plus a shared eastbound through + right configuration; the westbound approach was assumed to have the same configuration. It can be seen that both the eastbound and westbound approaches to the intersection are expected to operate with relatively high delays at LOS E during the AM peak hour, primarily due to the 130 second long signal cycle that is coordinated with the Marine Drive traffic signal.

The operations in the tables below are considered the "base" scenario which follows the same mitigation measures assumed in Bunt's previous TIA's for the nearby developments. These previous TIA's did not

explicitly account for traffic generated by the proposed development or the nearby 2030 – 2050 Marine Drive development. Therefore, with these larger traffic volumes compared to what was previously assumed (mainly concentrated on the west leg of Curling Road) additional mitigation measures may be necessary.

Table 3.10: Curling Road / Capilano Road – AM Peak Hour – 2020 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.24	0.80	0.64	0.20	0.68	
Delay (s)	51	75	31	1	10	
LOS	D	E	C	A	A	
50th Queue (m)	12	38	m24	5	135	
ST Average Queue (m)	12	20	30	19	95	
95th Queue (m)	25	72	20	5	134	
ST 95th Queue (m)	27	34	35	71	132	
Intersection V/C:		*0.70*	*Intersection LOS (Delay):*			*B (14)*
TOTAL 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.24	0.82	0.63	0.20	0.69	
Delay (s)	50	75	31	1	12	
LOS	D	E	C	A	B	
50th Queue (m)	13	43	11	5	136	
ST Average Queue (m)	12	20	27	56	89	
95th Queue (m)	26	77	m21	6	m135	
ST 95th Queue (m)	27	34	38	119	136	
Intersection V/C:		*0.71*	*Intersection LOS (Delay):*			*B (16)*

Table 3.11: Curling Road / Capilano Road – PM Peak Hour – 2020 Background / Total Conditions

	EASTBOUND		NORTHBOUND		SOUTHBOUND	
MOVEMENT	L	R	L	T	T	R
BACKGROUND 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.34	0.08	0.42	0.61	0.48	
Delay (s)	27	25	6	4	2	
LOS	C	C	A	A	A	
50th Queue (m)	8	0	2	19	4	
ST Average Queue (m)	11	12	28	55	56	
95th Queue (m)	18	12	m12	43	10	
ST 95th Queue (m)	23	21	39	80	113	
Intersection V/C:		*0.61*	*Intersection LOS (Delay):*			*A (5)*
TOTAL 2020						
Geometry	L-R		L-T-T		T-T/R	
v/c	0.31	0.07	0.43	0.61	0.47	
Delay (s)	27	26	6	3	2	
LOS	D	E	C	A	B	
50th Queue (m)	7	0	2	13	4	
ST Average Queue (m)	9	10	27	49	49	
95th Queue (m)	16	11	m13	42	10	
ST 95th Queue (m)	18	18	37	79	106	
Intersection V/C:		*0.60*	*Intersection LOS (Delay):*			*A (5)*

Table 3.12: Curling Road / Capilano Road – AM Peak Hour – 2030 Background / Total Conditions

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
BACKGROUND 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.31	0.75		0.35	0.12		0.47	0.22		0.06	0.69	
Delay (s)	52	68		54	50		23	2		4	7	
LOS	D	E		D	D		C	A		A	A	
50th Queue (m)	13	39		7	5		7	9		2	60	
ST Average Q (m)	16	31		7	10		10	13		3	74	
95th Queue (m)	25	64		17	16		m12	13		m3	123	
ST 95th Queue (m)	34	49		16	22		24	29		10	91	
INTERSECTION V/C: 0.70							*INTERSECTION LOS (DELAY): B (12)*					
TOTAL 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.30	0.78		0.34	0.12		0.44	0.22		0.06	0.70	
Delay (s)	51	69		53	48		22	2		5	8	
LOS	D	E		D	D		C	A		A	A	
50th Queue (m)	13	44		7	6		5	9		2	61	
ST Average Q (m)	16	31		8	9		8	13		3	74	
95th Queue (m)	26	70		16	17		m10	14		m4	180	
ST 95th Queue (m)	33	48		18	22		20	27		10	91	
INTERSECTION V/C: 0.71							*INTERSECTION LOS: B (13)*					

Table 3.13: Curling Road / Capilano Road – PM Peak Hour – 2030 Background / Total Conditions

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
BACKGROUND 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.49	0.29		0.11	0.39		0.35	0.63		0.19	0.49	
Delay (s)	29	26		26	27		5	5		4	2	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	9	5		2	6		4	32		0	4	
ST Average Q (m)	14	19		4	14		23	60		7	46	
95th Queue (m)	19	18		m5	16		m10	64		1	9	
ST 95th Queue (m)	29	35		12	26		38	83		20	83	
INTERSECTION V/C: 0.65							*INTERSECTION LOS (DELAY): A (7)*					
TOTAL 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.46	0.31		0.11	0.43		0.36	0.63		0.18	0.49	
Delay (s)	29	26		26	27		5	5		4	2	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	8	6		2	10		3	24		0	5	
ST Average Q (m)	12	17		3	13		24	57		8	49	
95th Queue (m)	18	20		m5	17		m9	61		2	10	
ST 95th Queue (m)	25	33		10	26		37	76		21	85	
INTERSECTION V/C: 0.64							*INTERSECTION LOS: A (6)*					

For the 2020 AM peak hour, the northbound left turn was shown to consistently exceed the 20m storage bay with SimTraffic average and 95th percentile queues of 27m and 38m, respectively. This is because permissive left turning vehicles have difficulties finding gaps in the AM peak hour with the heavy southbound through movements and most left turns must be completed during the intergreen time at the end of the 130 second cycle. To address this queuing issue, Bunt explored a number of further mitigation measures compared to what was previously assumed, including:

- Protected / permissive northbound left turn phasing with 130 second cycle;
- Permissive phasing northbound left turn phasing with 65 second cycle; and,
- Protected / permissive northbound left turn phasing with 65 second cycle.

Table 3.14 compares the v/c, LOS, and 95th queue (SimTraffic) of the eastbound right, northbound left, and southbound through for the "base" scenario and the three mitigation measures explored.

Table 3.14: Curling Road / Capilano Road – AM Peak Hour – Mitigation Measures

SCENARIO	MOVEMENT	V/C	LOS	50TH QUEUE (M)	95TH QUEUE (M)
"Base" Permissive – 130 Second Cycle	EBR	0.80	E	20	34
	NBL	0.64	C	30	35
	SBT	0.68	A	95	132
	Overall	*0.57*	*B*		
Protected/Permissive 130 Second Cycle	EBR	0.56	D	19	33
	NBL	0.26	B	15	28
	SBT	0.75	B	97	134
	Overall	*0.74*	*B*		
Permissive – 65 Second Cycle	EBR	0.62	C	18	29
	NBL	0.63	D	29	38
	SBT	0.65	A	103	128
	Overall	*0.79*	*A*		
Protected/Permissive 65 Second Cycle	EBR	0.52	C	17	31
	NBL	0.32	C	16	30
	SBT	0.88	A	104	120
	Overall	*0.85*	*A*		

Following a review of these mitigation options and the priority on maintaining as much green time for the southbound direction for the Capilano corridor in the AM peak, the protected / permissive phasing with the 130 second cycle was selected as the most appropriate mitigation measure. Introducing a protected phase helps alleviate the northbound left queuing issue while minimizing the impact to the southbound through movement compared to the other mitigation measures. For example, the permissive only 65 second cycle scenario does not provide significant benefit for the northbound left queue compared to the base scenario as left turning vehicles still have difficulties finding gaps and most turns occur in the intergreen time. While the protected/permissive 65 second cycle scenario does help the northbound left, it was considered to have too large of a negative impact on the heavy southbound through movement.

With the recommended mitigation measure, an eastbound right overlap phase could be provided alongside the northbound left protected phase to increase eastbound right turn throughput and minimize queues.

For the Total 2030 AM Scenario, with the expected Curling Road extension to McGuire Avenue, the northbound left turn demand is expected to decrease as vehicles approaching from the east can turn earlier at McGuire Avenue / Marine Drive and travel through the Curling Road / Capilano Road intersection thus avoiding the busy intersection of Marine Drive / Capilano Road. Therefore, with the introduction of a fourth leg at Curling Road / Capilano Road the protected/permissive phasing could revert back to the "base" scenario of permissive phasing only and still maintain acceptable queue lengths, as shown in Table 3.9. Furthermore, the assumed left and shared through/right laning in the four leg configuration, the effect of the eastbound overlap phase will be minimal as right turn vehicles would be required to share a lane with through vehicles.

Marine Drive / Capilano Road

Tables 3.15 through **3.18** summarize the reported HCM 2000 performance of Marine Drive / Capilano Road with the Synchro and SimTraffic (ST) queues in the AM and PM Peak hours for the two horizon years under both Background and Total traffic conditions.

This intersection is expected to be close to capacity during both the 2020 AM and PM peak hour all scenarios, even with the improvements to the southbound direction as part of the Pacific Gate Grouse Inn development. The peak demand movements in the AM will continue to be the southbound right turn and the westbound through movement. In the PM Peak hour, the peak demand movements will continue to be the eastbound left turn and through movements. Long queues are expected to be present for the southbound right turn movement, as they are today during the AM peak hour. Also in the 2020 AM peak hour scenarios, the westbound left turn is expected to operate with long delays but this is primarily a result of the long 130 second cycle; as this left turn movement is also expected to have low demand volumes (less than 20 vph) the high delays are not considered a significant operational issues for this intersection. The eastbound left turn during the PM peak hour is anticipated to have a v/c of 0.86 for the 2020 Background and Total Scenarios.

For the 2030 Scenarios, the overall intersection operations are expected to be relatively similar to the 2020 Scenarios. This is because the expected increase in traffic volumes due to general background and site specific growth is similar to the amount of vehicles that will reroute with the implementation of alternative routes (i.e Curling Road extension).

The southbound left is expected to operate with a LOS F and a high v/c ratio in both the 2020 and 2030 PM Peak. Protected/permissive phasing was explored as a mitigation measure to improve the expected operations of this movement. However as the assumed 130 second cycle length is already at the upper limit of recommended cycle lengths, to achieve a southbound protected left turn phase, green time must be taken from heavy eastbound left movement rather than increasing the overall cycle length. Reducing the green time for the eastbound left turn would result in significantly longer queues for the dominant flow. Given the priority to maximize green time for the Capilano corridor and that the eastbound left turn is near capacity, introducing a protected phase is not a recommended mitigation measure. It is expected that if significant queuing is experienced for the southbound left movement at Marine Drive, vehicles travelling southbound on Capilano Road will reroute to McGuire Avenue or Garden Avenue.

Table 3.15: Marine Drive / Capilano Road – AM Peak Hour – 2020

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
BACKGROUND 2020												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.86	0.56	0.08	0.57	0.77	0.08	0.04	0.09	0.02	0.25	0.06	**0.95**
Delay (s)	73	35	29	82	49	38	17	17	0	22	19	38
LOS	E	C	C	F	D	D	B	B	A	C	B	D
50th Queue (m)	54	66	0	4	84	0	3	11	0	26	9	224
ST Average Q (m)	146	71	9	5	112	31	5	19	4	21	11	82
95th Queue (m)	71	97	13	12	101	8	8	19	0	m36	m12	252
ST 95th Queue (m)	261	162	38	23	171	58	15	46	24	40	38	105
*INTERSECTION V/C: **0.97***							*INTERSECTION LOS (DELAY): D (42)*					
TOTAL 2020												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.86	0.63	0.10	0.47	0.81	0.06	0.04	0.10	0.02	0.22	0.07	0.95
Delay (s)	82	35	28	88	51	39	17	18	0	22	18	43
LOS	E	C	C	F	D	D	B	B	A	C	B	D
50th Queue (m)	53	66	0	5	85	0	3	10	0	28	9	238
ST Average Q (m)	107	58	11	7	119	33	7	15	2	21	8	80
95th Queue (m)	70	98	13	13	109	8	8	19	0	m39	m12	268
ST 95th Queue (m)	213	120	43	31	176	58	18	47	14	42	28	105
*INTERSECTION V/C: **0.97***							*INTERSECTION LOS: D (44)*					

Table 3.16: Marine Drive / Capilano Road – PM Peak Hour – 2020

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
BACKGROUND 2020												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.86	0.60	0.19	0.54	0.76	0.56	0.54	0.56	0.02	**0.97**	0.26	0.31
Delay (s)	73	35	29	82	49	38	17	17	0	22	19	38
LOS	D	C	B	E	D	D	D	D	A	**F**	C	A
50th Queue (m)	157	111	7	12	66	28	38	62	0	49	20	9
ST Average Q (m)	164	72	22	10	83	41	72	54	8	64	70	36
95th Queue (m)	187	136	21	25	81	59	62	90	0	92	33	20
ST 95th Queue (m)	238	155	64	26	148	53	126	99	34	98	132	95
*INTERSECTION V/C: **0.88***							*INTERSECTION LOS (DELAY): D (35)*					
TOTAL 2020												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.85	0.60	0.19	0.54	0.76	0.58	0.55	0.58	0.02	**0.98**	0.26	0.32
Delay (s)	82	35	28	88	51	39	17	18	0	22	18	43
LOS	D	C	B	E	D	D	D	D	A	**F**	C	A
50th Queue (m)	155	110	6	12	66	29	39	63	0	47	20	9
ST Average Q (m)	124	61	25	12	79	41	78	66	7	66	65	24
95th Queue (m)	184	134	20	25	81	60	62	92	0	93	32	20
ST 95th Queue (m)	195	93	70	34	137	53	135	123	32	102	134	72
*INTERSECTION V/C: **0.88***							*INTERSECTION LOS: C (35)*					

Table 3.17: Marine Drive / Capilano Road – AM Peak Hour – 2030

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
BACKGROUND 2030												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.85	0.67	0.10	0.27	0.82	0.06	0.04	0.10	0.02	0.21	0.07	**0.95**
Delay (s)	69	40	31	50	43	15	18	18	0	20	19	21
LOS	E	D	C	D	D	B	B	B	A	C	B	C
50th Queue (m)	60	98	3	5	121	0	4	12	0	16	8	96
ST Average Q (m)	58	60	17	12	74	27	6	12	0	12	6	46
95th Queue (m)	78	112	16	13	88	4	9	22	0	m28	m15	110
ST 95th Queue (m)	84	96	56	44	162	58	17	26	0	27	15	70
*INTERSECTION V/C: **0.98***							*INTERSECTION LOS (DELAY): C (34)*					
TOTAL 2030												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.86	0.67	0.11	0.28	0.82	0.06	0.04	0.10	0.02	0.20	0.07	**0.95**
Delay (s)	71	40	31	52	43	15	17	17	0	20	19	22
LOS	E	D	C	D	D	B	B	B	A	C	B	C
50th Queue (m)	54	66	0	4	84	0	3	11	0	26	9	224
ST Average Q (m)	55	62	22	11	124	30	8	11	0	12	5	41
95th Queue (m)	71	97	13	12	101	8	8	19	0	m36	m12	252
ST 95th Queue (m)	83	92	67	40	165	60	21	26	0	26	17	66
*INTERSECTION V/C: **0.98***							*INTERSECTION LOS: C (34)*					

Table 3.18: Marine Drive / Capilano Road – PM Peak Hour – 2030

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**	**L**	**T**	**R**
BACKGROUND 2030												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.85	0.72	0.23	0.36	0.84	0.35	0.63	0.66	0.02	**1.00**	0.31	0.35
Delay (s)	40	26	18	45	45	24	48	48	0	115	32	43
LOS	D	C	B	D	D	C	D	D	A	**F**	C	A
50th Queue (m)	157	148	11	14	76	12	43	742	0	38	24	6
ST Average Q (m)	177	106	50	20	90	36	106	79	6	49	37	21
95th Queue (m)	185	160	26	25	78	12	69	104	0	80	35	12
ST 95th Queue (m)	255	188	88	51	166	58	142	147	29	88	92	60
*INTERSECTION V/C: **0.90***							*INTERSECTION LOS (DELAY): C (34)*					
TOTAL 2030												
Geometry	L-L-T-T-R			L-T-T-T-R			L-T-R			L-T-R-R		
v/c	0.83	0.71	0.23	0.35	0.83	0.36	0.64	0.69	0.02	**1.01**	0.31	0.36
Delay (s)	40	26	18	45	45	24	48	48	0	115	32	43
LOS	D	C	B	D	D	C	D	D	A	**F**	C	A
50th Queue (m)	155	148	11	14	76	14	44	73	0	35	23	7
ST Average Q (m)	166	88	36	19	75	36	99	69	4	46	36	16
95th Queue (m)	183	157	25	25	79	11	70	105	0	75	34	14
ST 95th Queue (m)	243	149	84	46	134	57	143	137	25	89	94	46
*INTERSECTION V/C: **0.89***							*INTERSECTION LOS: C (33)*					

Capilano Road / McGuire Road

By 2030, the McGuire Avenue extension northwards across Capilano Road to the "Woonerf" road is expected to be in place. **Table 3.19 and 3.120** summarize the 2030 intersection operations expected at this location for both time periods and traffic scenarios. Overall, it can be seen that the intersection is expected to operate well under the assumed signal coordination and timing plans.

Table 3.19: McGuire Avenue / Capilano Road – AM Peak Hour – 2030

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
BACKGROUND 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.00	0.00		0.00	0.04		0.00	0.23		0.03	0.67	
Delay (s)	31	31		32	32		1	1		1	6	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	0	0		0	0		0	0		0	7	
ST Average Q (m)	0	0		0	2		0	8		2	68	
95th Queue (m)	0	0		0	4		0	12		0	m29	
ST 95th Queue (m)	0	3		0	9		0	19		9	103	
INTERSECTION V/C: 0.66							*INTERSECTION LOS (DELAY): A (5)*					
TOTAL 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.00	0.00		0.00	0.04		0.00	0.23		0.03	0.67	
Delay (s)	31	31		32	32		1	1		1	6	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	0	0		0	0		0	0		0	8	
ST Average Q (m)	0	0		0	3		0	9		2	65	
95th Queue (m)	0	0		0	4		0	12		0	m28	
ST 95th Queue (m)	0	3		0	10		0	20		9	102	
INTERSECTION V/C: 0.66							*INTERSECTION LOS (DELAY): A (5)*					

Table 3.20: McGuire Avenue / Capilano Road – PM Peak Hour – 2030

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
BACKGROUND 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.00	0.00		0.00	0.17		0.00	0.58		0.11	0.35	
Delay (s)	31	31		33	33		1	1		1	1	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	0	0		0	1		0	0		0	7	
ST Average Q (m)	0	2		0	4		0	29		6	19	
95th Queue (m)	0	0		0	6		0	22		0	2	
ST 95th Queue (m)	0	7		0	12		0	63		16	62	
INTERSECTION V/C: 0.57							*INTERSECTION LOS (DELAY): A (1)*					
TOTAL 2030												
Geometry	L-T/R			L-T/R			L-T-T/R			L-T-T/R		
v/c	0.00	0.00		0.00	0.17		0.00	0.58		0.11	0.35	
Delay (s)	31	31		33	33		1	1		1	1	
LOS	C	C		C	C		A	A		A	A	
50th Queue (m)	0	0		0	1		0	0		0	0	
ST Average Q (m)	0	1		0	4		0	24		6	27	
95th Queue (m)	0	0		0	6		0	20		0	2	
ST 95th Queue (m)	0	5		0	12		0	51		17	76	
INTERSECTION V/C: 0.57							*INTERSECTION LOS (DELAY): A (1)*					

Glenaire Drive / Curling Road

The intersection of Glenaire Drive / Curling Road was also analyzed. While the site access is further west of the intersection of Glenaire Drive / Curling Road, all site traffic must travel through this intersection and it is anticipated to be busier compared to the site access. The intersection was shown to operate acceptably for both the AM and PM peak hours. **Table 3.21** summarizes the results. Only the Total 2030 operations have been presented as they are similar to the 2020 scenario.

Table 3.21: Curling Road / Glenaire Drive – AM & PM Peak Hour – 2020/2030

	EASTBOUND			WESTBOUND			NORTHBOUND			SOUTHBOUND		
MOVEMENT	L	T	R	L	T	R	L	T	R	L	T	R
TOTAL 2020/2030 AM												
Geometry	L/T/R			L/T/R			L/T/R			L/T/R		
v/c	0.00			0.01			0.04			0.02		
Delay (s)	0			2			9			9		
LOS	A			A			A			A		
ST Average Q (m)	0			0			6			3		
ST 95th Queue (m)	0			1			14			10		
INTERSECTION V/C: N/A							*INTERSECTION LOS (DELAY): A (6)*					
TOTAL 2020/2030 PM												
Geometry	L/T/R			L/T/R			L/T/R			L/T/R		
v/c	0.00			0.02			0.02			0.02		
Delay (s)	0			2			9			10		
LOS	A			A			A			B		
ST Average Q (m)	0			0			5			2		
ST 95th Queue (m)	0			2			12			8		
INTERSECTION V/C: N/A							*INTERSECTION LOS (DELAY): A (3)*					

3.2.1 Queue Analysis

Because of the significant operational influence of overflowing turn bays and closely spaced intersections on congested corridors, the SimTraffic micro-simulation model was utilized to provide insight to anticipated queues, in addition to Synchro.

We note that several of the queues reported by SimTraffic are consistent with those reported by Synchro, while others are significantly different; it is our view the SimTraffic results are likely more realistic, but that neither software is capable of taking into account the effects of the spreading congestion "footprint" of the downstream Lions Gate Bridge. Particularly during the PM Peak Hour, the bridge congestion results in a significant decline in the quality of operations at the Marine Drive / Capilano Road traffic signal and illegal blocking behaviours by drivers which cannot be captured by the software.

During the peak hour, 95th percentile queue conditions may only be experienced once or twice during the busiest peak period of the day, and therefore do not provide insight to typical conditions. Also, in our

experience, SimTraffic over-estimates 95th percentile queues under congested urban conditions because SimTraffic does not accurately portray particular driver behaviours under such conditions: for example, where drivers in the main traffic stream may yield to side street entering drivers as a courtesy, or where drivers may choose to illegally block intersections. As such, in our experience, the 95th percentile queues reported are often found to unrealistically conservative in representing actual queuing "culture" in a congested network.

4. SITE PLAN DESIGN REVIEW

4.1 Site Access Design

The proposed development has been designed for a single access point on the north site of the site connecting to Klahanie Court. This access connects both to the parkade ramp for visitor and residential parking, and to a motorcourt area. The motorcourt serves multiple purposes, including pick-up/drop-off in front of the lobby, residential loading, garbage and recycling servicing, and fire truck access.

4.2 Parking Supply

4.2.1 Vehicle Parking

The District of West Vancouver's Marine Drive Local Area Plan and Design Guidelines (April 2017) governs the minimum parking requirements for the proposed development. The requirements are per the Local Area Plan are:

- 1.25 parking spaces per residential (strata) dwelling unit; and,
- 0.75 parking spaces per purpose-built rental dwelling unit.

With these rates, the total parking requirement for the proposed development is summarized in **Table 4.1**.

Table 4.1: Vehicle Parking Supply Requirement & Provision

LAND USE	UNITS	BYLAW RATE	BYLAW SUPPLY REQUIREMENT	PROVIDED
Residential - Strata	91	1.25 parking spaces for every dwelling unit	114	201
Residential - Rental	42	0.75 parking spaces for every dwelling unit	32	
			146	201

The development is proposing to exceed the minimum parking requirements. In general, 201 parking spaces are proposed, which equates to a blended rate of 1.51 stalls per unit. The parking will be provided through two levels of underground parking for both residents and visitors.

4.2.1 Disabled Parking

Based on the District of West Vancouver Zoning Bylaw 4662 Section 140, the disabled parking spaces shall be provided in accordance to **Table 4.2**.

Table 4.2: Disabled Parking Requirements

TOTAL REQUIRED PARKING SPACES	REQUIRED SPACES FOR PERSONS WITH DISABILITIES
10-75	1
76-125	2
126-200	3
Over 200	3 spaces plus one space for every 100 spaces or fraction thereof in excess of 200

From **Table 4.2**, the required parking spaces fall in the range of 126-200 spaces therefore, a total of 3 disabled spaces are required under the Bylaw. **Table 4.3** summarizes the total parking provision for this development.

Table 4.3: Total Parking Provisions

PARKING TYPE	PARKING PROVISION
Residential Rental	30
Residential Rental – Disabled	2
Residential Visitor	5
Residential Visitor - Disabled	1
Residential Market	166
Residential Market - Disabled	3
TOTAL	201

The proposed development is proposing to provide 201 parking spaces with 6 spaces being classified as disabled stalls. 5 visitor spaces are proposed, which falls below the generally accepted residential visitor parking supply rate of 0.10 spaces per dwelling unit. For Bunt studies, it was found that the general visitor parking rate for multifamily residential buildings would be in the order of 0.1 stalls / unit. As part of this study, the developer is providing in the order of 0.025 stalls / unit with surplus parking for residents. As there is surplus resident parking, it is expected that after the opening of the project, some visitors will be using resident parking instead. A management mechanism will be needed and is expected to be managed by the Strata.

4.2.2 Bicycle Parking

Aside from the cycle path connectivity, the availability of bicycle parking within the site is also very important. The ability for residents to have adequate storage on-site dictates their use of bicycle as a plausible mode choice.

Class 1 Bicycle Parking (Long Term): Requirement & Recommendations

The District of West Vancouver's bylaws do not specify bicycling storage requirements. In contrast, the District of North Vancouver (DNV) Bylaw usually requires a minimum number of bicycle parking spaces to be provided for residential units by the development at a rate of 1 space per unit as seen in most recent larger multi-family developments. These spaces are intended for long term storage and must be provided in a secured, separate bicycle room within a building.

Furthermore, it is recommended that all secure bicycle storage include level 1 (110v) electric outlets for electric bicycle charging.

In order to help encourage residents to cycle, we recommend a total of 2 spaces per unit. This rate is twice the DNV bylaw required minimum. The two spaces per unit are recommended to be broken down as follows:

- 1 space per unit be provided in a separate locker, and
- 1 space per unit in a common secure and separate bicycle storage room

This breakdown of space is considered appropriate for a few reasons. First, having an individual bicycle storage locker is important for those residents wishing for an extra level of security for valuable bikes (the cost of a road bike starts of at approximately $800 but can be as much as $8,000). It is reasonable to assume a two-person household could easily have two bicycles, and as this area of the District continues through its redevelopment, it will be increasingly more bikeable, with a greater diversity of land uses and destinations. However, bicycle lockers are costly and take up greater area in the main or underground parking level. For this reason, and in order to provide sufficient bicycle parking for those units with greater demand for bicycles, we recommend additional supply be provided in a communal but secure bike storage room.

Class 2 Bicycle Parking (Short Term): Requirement & Recommendations

As with long term bicycle storage, the District of West Vancouver's bylaws do not specify specific storage requirements. It is common practice to provide 0.1 to 0.2 protected but unsecured parking spaces per residential unit for visitors' bikes. As the DNV bylaw requires a minimum of 0.2 Class 2 parking spaces per unit, it is recommended to match this amount to maintain continuity between developments in the Lower Capilano Marine Village Centre.

Provision

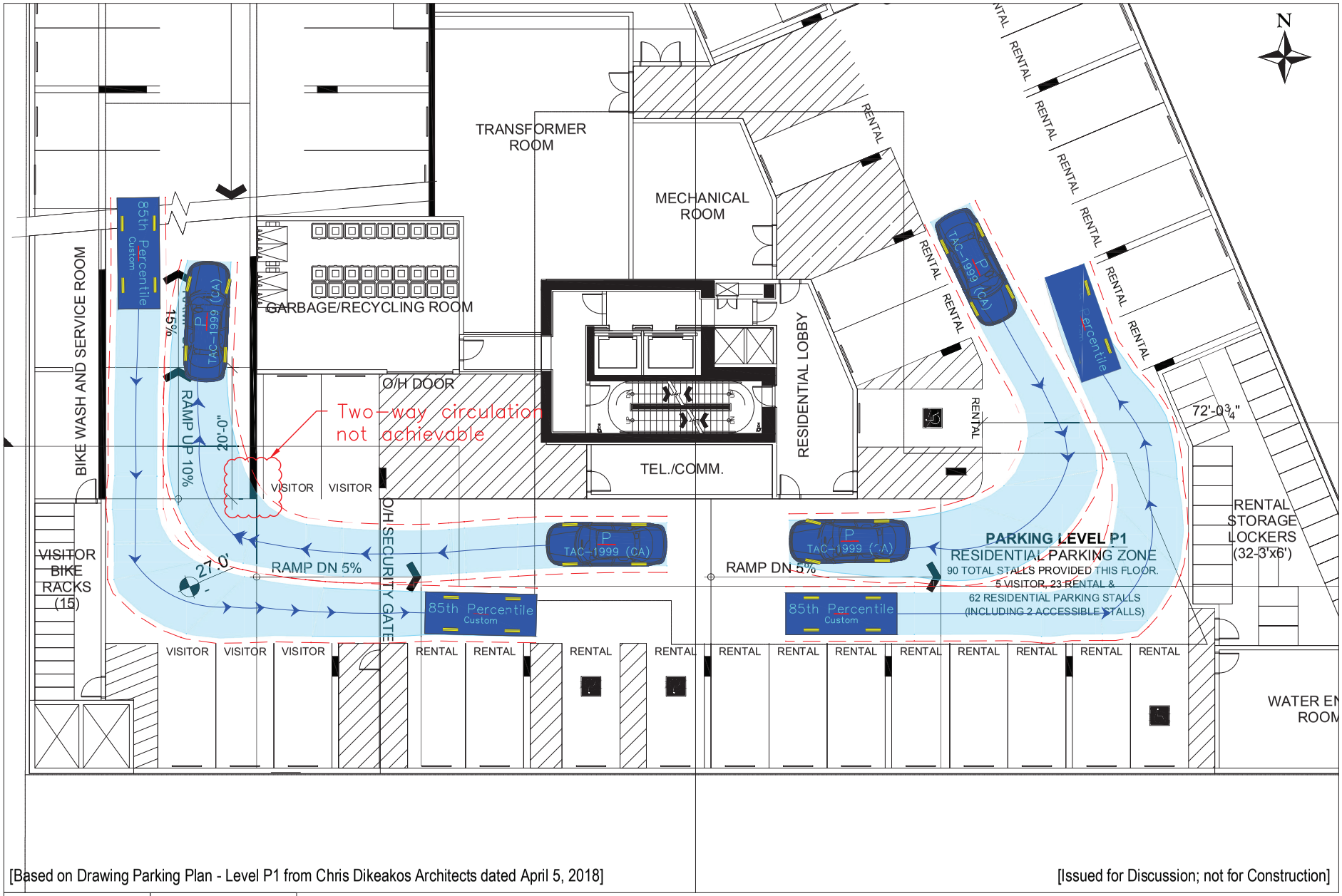
The developer is planning to provide 15 residential visitor bicycle parking spaces and 198 secured bicycle spaces for combined residential use. This equates to 213 bicycle spaces being provided for the 133 units. Sitting at around 1.6 stalls per dwelling unit total, this provision is larger than the DNV bylaw minimum rate binding other projects in the Lower Capilano Marine Village Centre. However, underground short term visitor bicycle parking is only provided at a rate of 0.11 stalls/unit. It is assumed that at-grade bicycle racks will be provided to supplement.

4.3 Parking Layout and On-Site Vehicle Circulation

The development can be accessed via the motorcourt in front of the building. Aside from the motorcourt, the parkade entrance is located to the western edge of the site and descends to two levels of underground parking. **Exhibit 4.1** shows vehicle circulation near the parkade entrance, and **Exhibit 4.2** shows a typical passenger vehicle accessing stalls throughout the parkade.

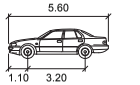
It is expected that garbage and recycling from the development will need to be brought out of the parkade garbage/recycling room in order to be serviced by a large garbage truck in the motorcourt area. **Exhibit 4.3** shows a typical jitney vehicle carrying a dumpster manoeuvring in and out of the garbage/recycling room on the first level of the parkade.

Pick-up/drop-off, residential loading, garbage/recycling servicing, and fire truck access are all expected to utilize the motorcourt area. **Exhibits 4.4** through **4.6** illustrate how an SU9 truck, a garbage truck, and a fire truck will access the site, respectively. With the current site design, SU9 trucks and Superduty garbage trucks are able to utilise the motorcourt without issue. However, a 47-foot fire truck may have trouble turning around, as the motorcourt itself is only 42 feet wide. If the fire truck cannot use the parkade ramp entrance while turning due to clearance constraints, it will have to back out approximately 50 metres onto Klahanie Court. **Exhibit 4.7** shows a passenger vehicle sweeping through the pick-up/drop off area with simultaneous use of other parts of the motorcourt for loading or garbage servicing.



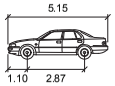
[Based on Drawing Parking Plan - Level P1 from Chris Dikeakos Architects dated April 5, 2018]

[Issued for Discussion; not for Construction]



P

	meters
Width	: 2.00
Track	: 2.00
Lock to Lock Time	: 6.0
Steering Angle	: 35.9



85th Percentile

	meters
Width	: 1.94
Track	: 1.66
Lock to Lock Time	: 6.0
Steering Angle	: 35.9

Exhibit 4.1
Passenger Vehicle Circulation AutoTURN Analysis

303 Marine Drive Update

04-17-0126 April 2018 Scale 1:250 on Letter Prepared by NM

bunt & associates

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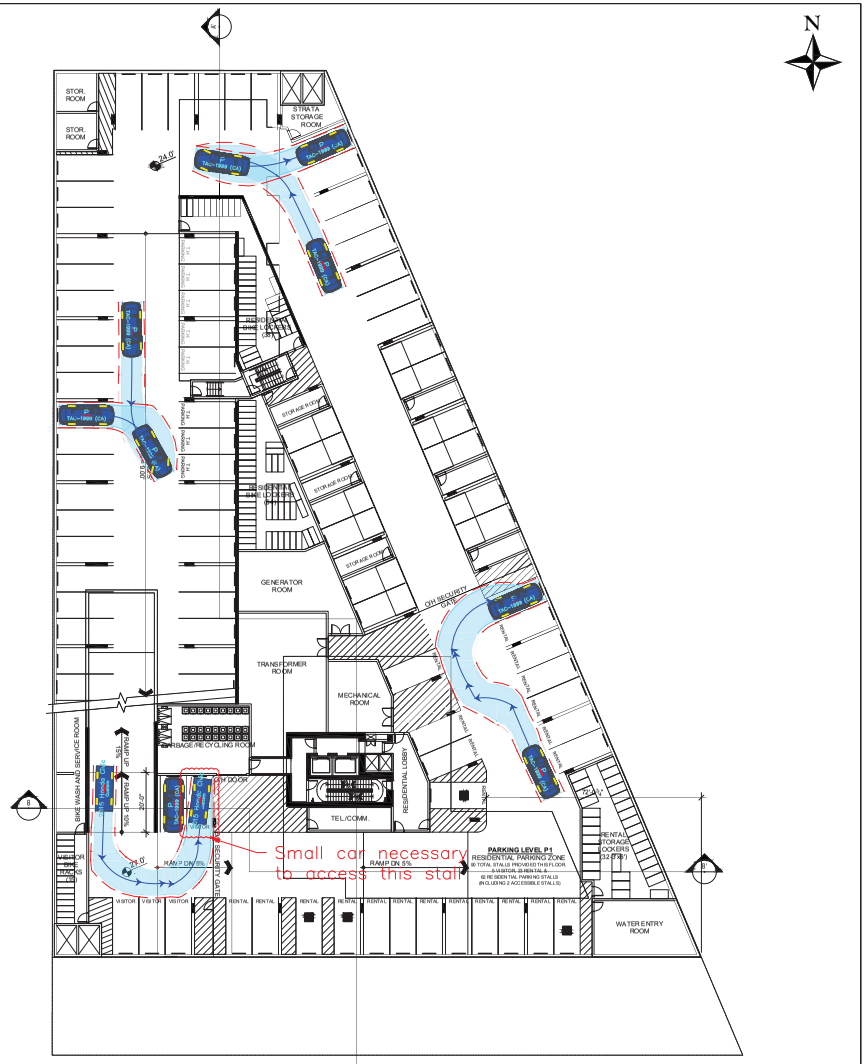
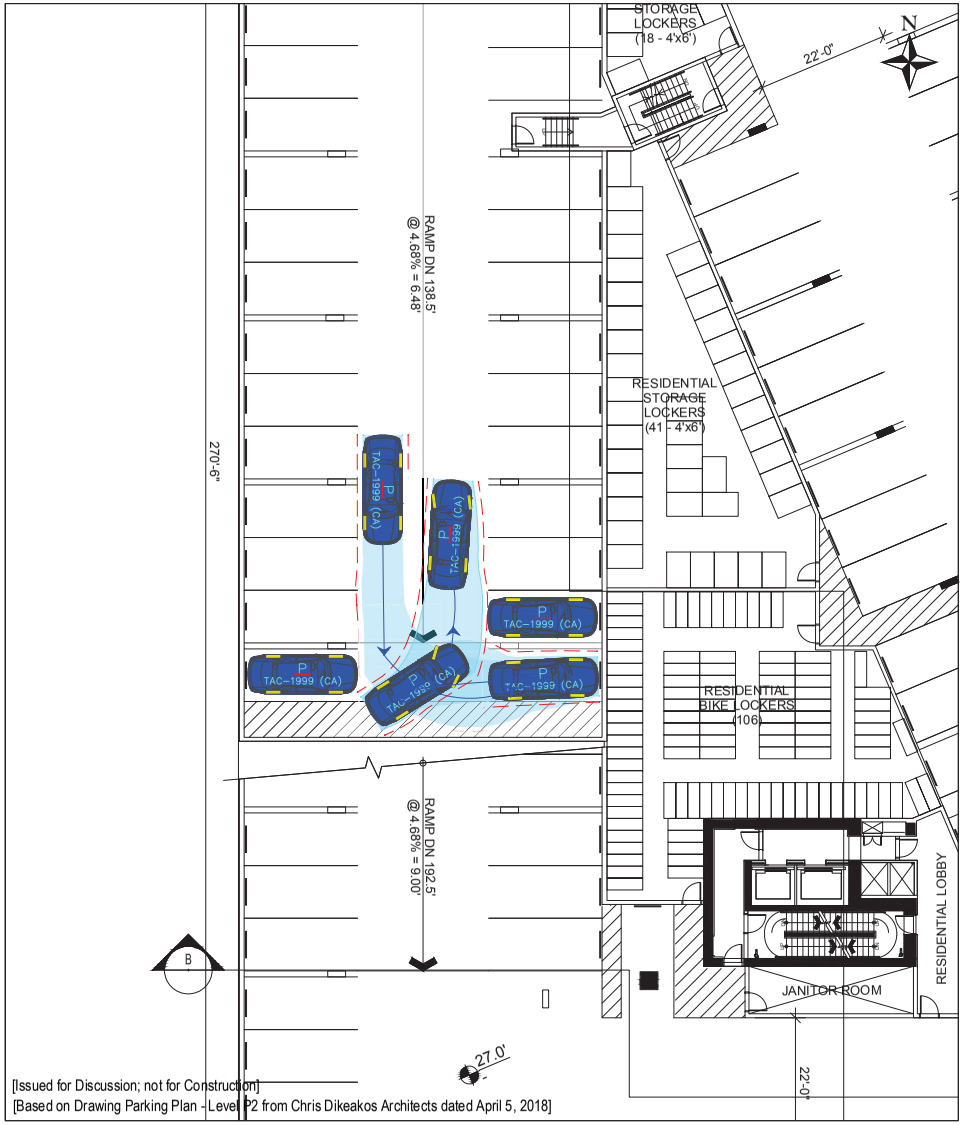
2018/04/20 14:00, Plotted by Nicolas Moss



[Issued for Discussion; not for Construction]
[Based on Drawing Parking Plan - Level P1 from Chris Dikeakos Architects dated April 5, 2018]



[Issued for Discussion; not for Construction]
[Based on Drawing Parking Plan - Level P2 from Chris Dikeakos Architects dated April 5, 2018]

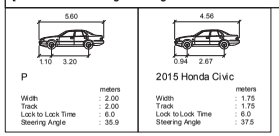
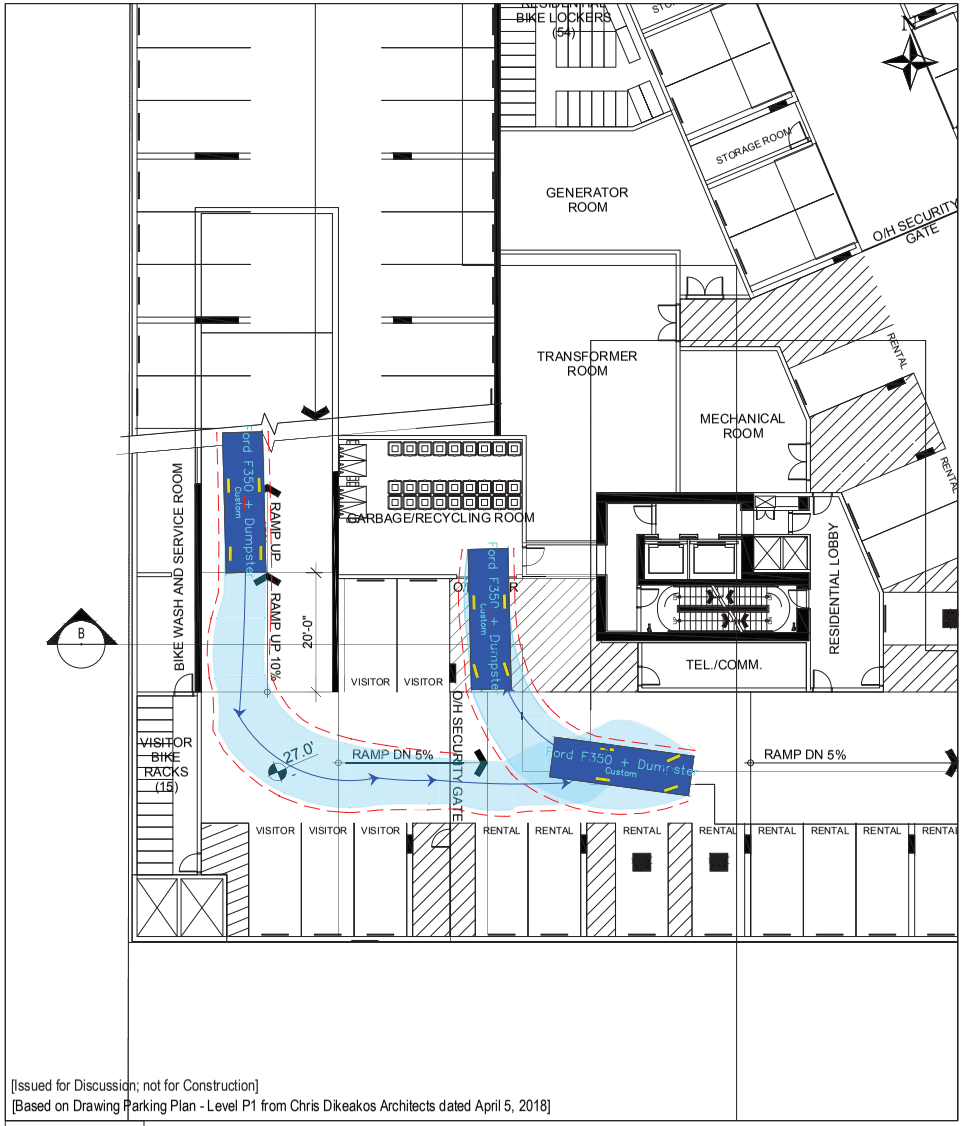


Exhibit 4.2

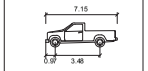
Passenger Vehicle Stall Access AutoTURN Analysis

303 Marine Drive Update
04-17-0126 April 2018 Scale 1:500 on Ledger Prepared by NM

bunt & associates

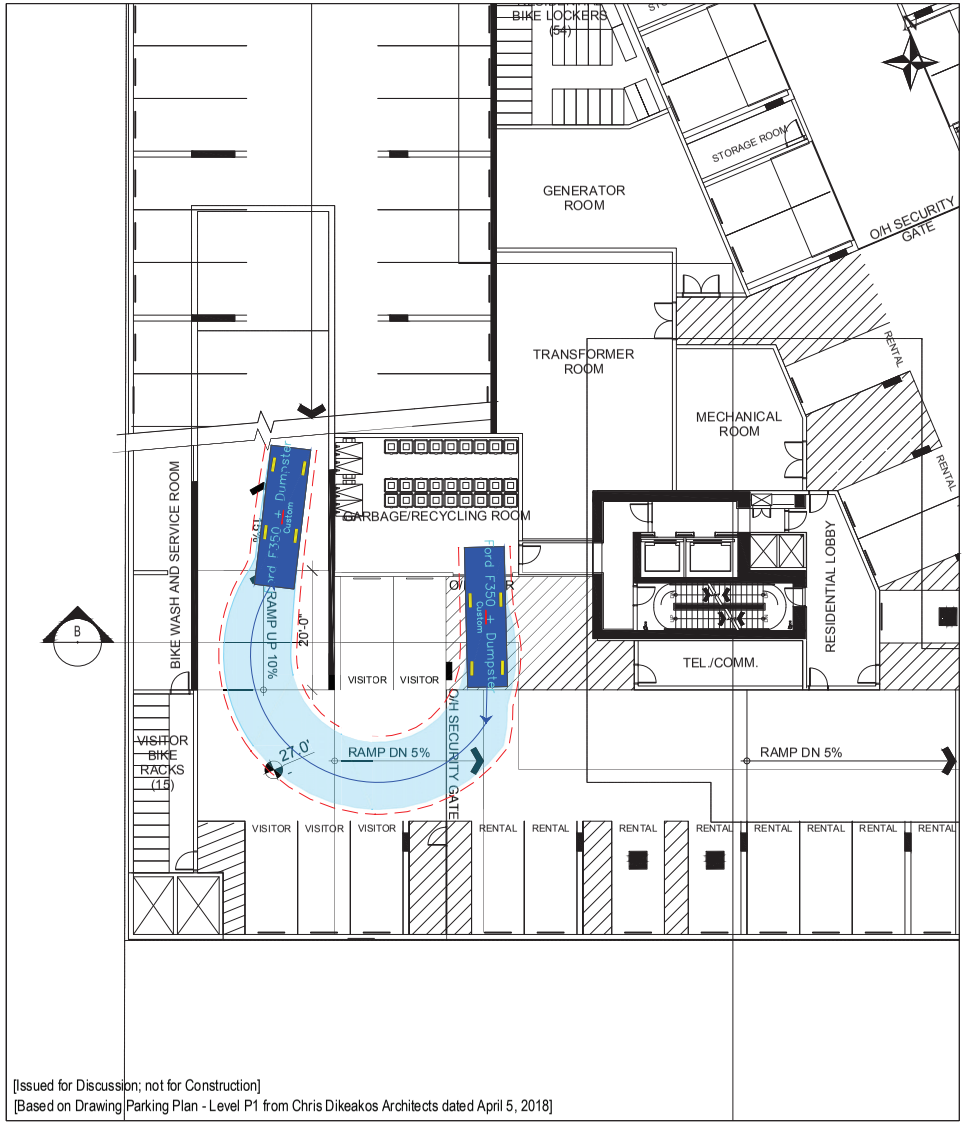


[Issued for Discussion; not for Construction]
[Based on Drawing Parking Plan - Level P1 from Chris Dikeakos Architects dated April 5, 2018]



Ford F350 + Dumpster

	meters
Width	: 2.03
Track	: 1.74
Lock to Lock Time	: 6.0
Steering Angle	: 32.2



[Issued for Discussion; not for Construction]
[Based on Drawing Parking Plan - Level P1 from Chris Dikeakos Architects dated April 5, 2018]

Exhibit 4.3

Jitney Vehicle AutoTURN Analysis

303 Marine Drive Update
04-17-0126 April 2018 Scale 1:250 on Ledger Prepared by NM

bunt & associates

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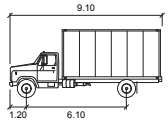
2018/04/20 14:01, Plotted by Nicolas Moss

[Based on Drawing Site Plan from Darwin dated March 29, 2018]

[Issued for Discussion; not for Construction]



SU9

	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 31.5

Exhibit 4.4

Loading AutoTURN Analysis

303 Marine Drive Update

04-17-0126 April 2018 Scale 1:500 on Letter Prepared by NM

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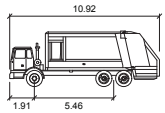
2018/04/20 14:01, Plotted by Nicolas Moss

[Based on Drawing Site Plan from Darwin dated March 29, 2018]

[Issued for Discussion; not for Construction]



Superduty

meters	
Width	: 2.58
Track	: 2.58
Lock to Lock Time	: 6.0
Steering Angle	: 40.0

Exhibit 4.5

Waste Management AutoTURN Analysis

303 Marine Drive Update

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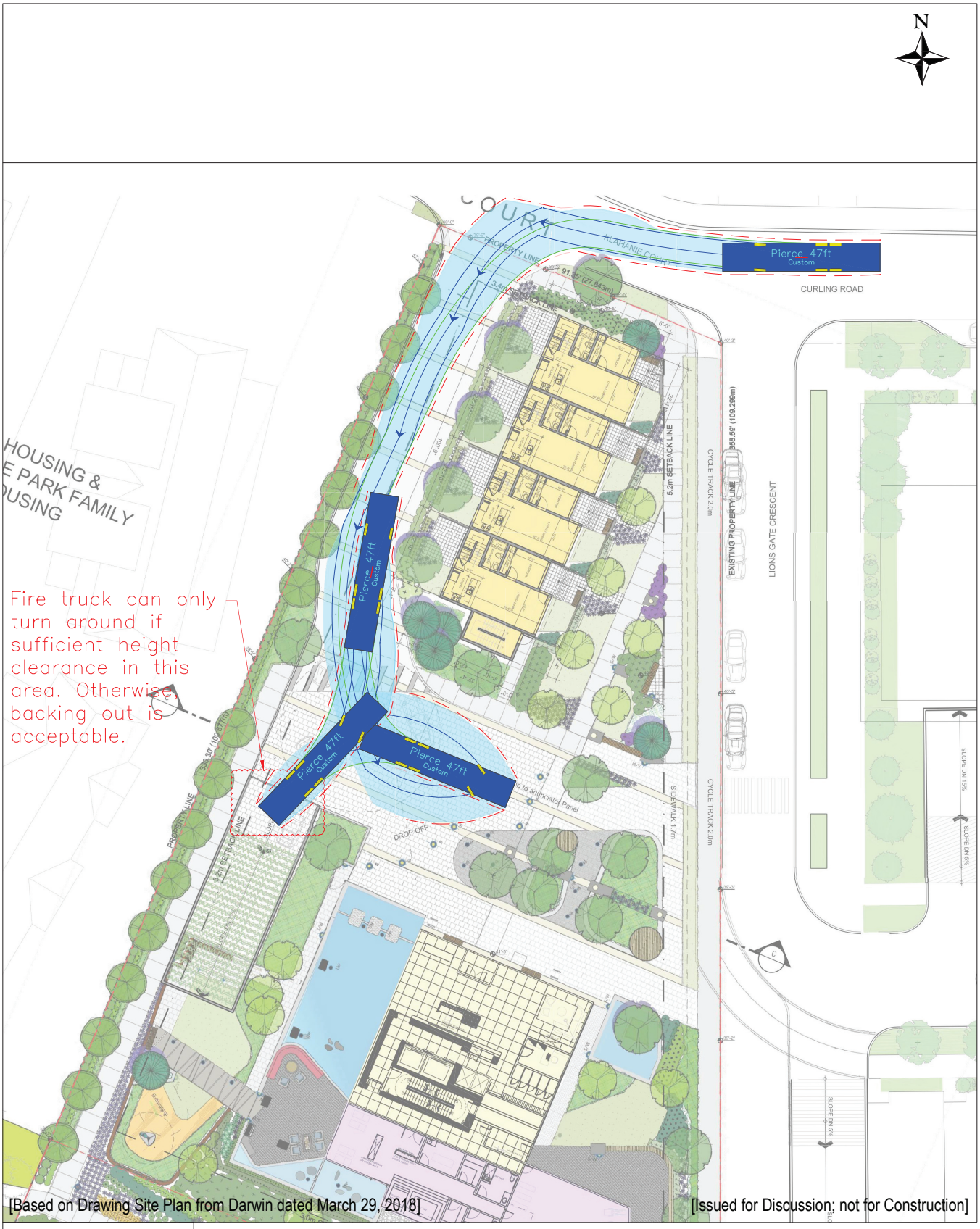

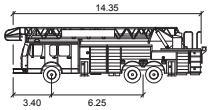

Pierce 47ft

	meters
Width	: 2.57
Track	: 2.57
Lock to Lock Time	: 6.0
Steering Angle	: 39.8

Exhibit 4.6

Fire Truck AutoTURN Analysis

303 Marine Drive Update

04-17-0126 April 2018 Scale 1:500 on Letter Prepared by NM

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2018/04/20 14:01, Plotted by Nicolas Moss

Exhibit 4.7

Motorcourt Multiuse Scenario AutoTURN Analysis

303 Marine Drive Update
04-17-0126 April 2018 Scale 1:500 on Letter Prepared by NM

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4.4 Site Access Sight Distance Analysis

The site is accessed by a single driveway connecting to Klahanie Court, which turns into Curling Road as the roads enters the DNV immediately east of 303 Marine Drive. A sight distance assessment was undertaken for both Stopping Sigh Distance (SSD) and Turning Sight Distance (TSD) at the driveway exit using the procedures set within the Transportation Association of Canada (TAC) Geometric Design Guidelines. As Curling Road is currently signed with a 50 km/h speed limit, a 50 km/h design speed was used for the analysis. However, as the village centre gets closer to build-out, the traffic calmed nature of the local roadways will likely induce slower speeds. Curling Road may eventually be signed at 30km/h, so an analysis at 30 km/h was also included. A review of each sight distance case tested is provided below.

Stopping Sight Distance – 50 km/h and 30 km/h

SSD is the minimum required sight distance per the TAC manual. SSD is the distance required for a vehicle travelling on the main road at a certain speed to perceive, react, and break when a vehicle from a minor road approach turns onto the main road. At 50 km/h, the required SSD is 65m. At 30 km/h, the required SSD drops to 30m. Both of these distances can be met looking to the east of the proposed driveway; however, an existing dumpster enclosure on the neighboring Klahanie Park Family Housing property blocks sightlines to the west for the design case where a driver is positioned 4.4m back from the curb edge. However, this may not be an issue for two reasons. For one, the design case conservatively places the front of the vehicle 2 meters back from the edge of the curb. When drivers encounter a sightline obstacle, they will often inch their vehicle forward to increase their sight distance as long as their vehicle does not enter the travel lane. Secondly, Klahanie Court ends in a cul-de-sac less than 100m west of the proposed driveway access, so it is likely that vehicles will not be travelling at full speed. Nonetheless, proposed landscaping and trees within the sight triangles should be no higher than 0.6m or limbed so there is 3m of clearance from grade. See **Exhibits 4.8** and **4.9** for details.

Turning Sight Distance – 50 km/h and 30 km/h

TSD is the distance required to allow vehicles from a minor street or driveway to turn onto the main road and accelerate to a speed that does not significantly interfere with vehicles already on the main road. At 50 km/h, the TSD of 105m can be met for westbound vehicles. However, there is no design case for an eastbound vehicle, as Klahanie Court does not extend west 105m and thus vehicles are not expected to operate at uninterrupted 50 km/h flow. Examining the 30 km/h condition that requires 65m of sight distance, westbound vehicles once again fall easily within the sight triangle, while eastbound vehicles may be obstructed by the existing dumpster enclosure. Assuming drivers will act as outlined in the previous paragraph, the 30 km/h TSD can be met. See **Exhibit 4.10** and **4.11** for details.

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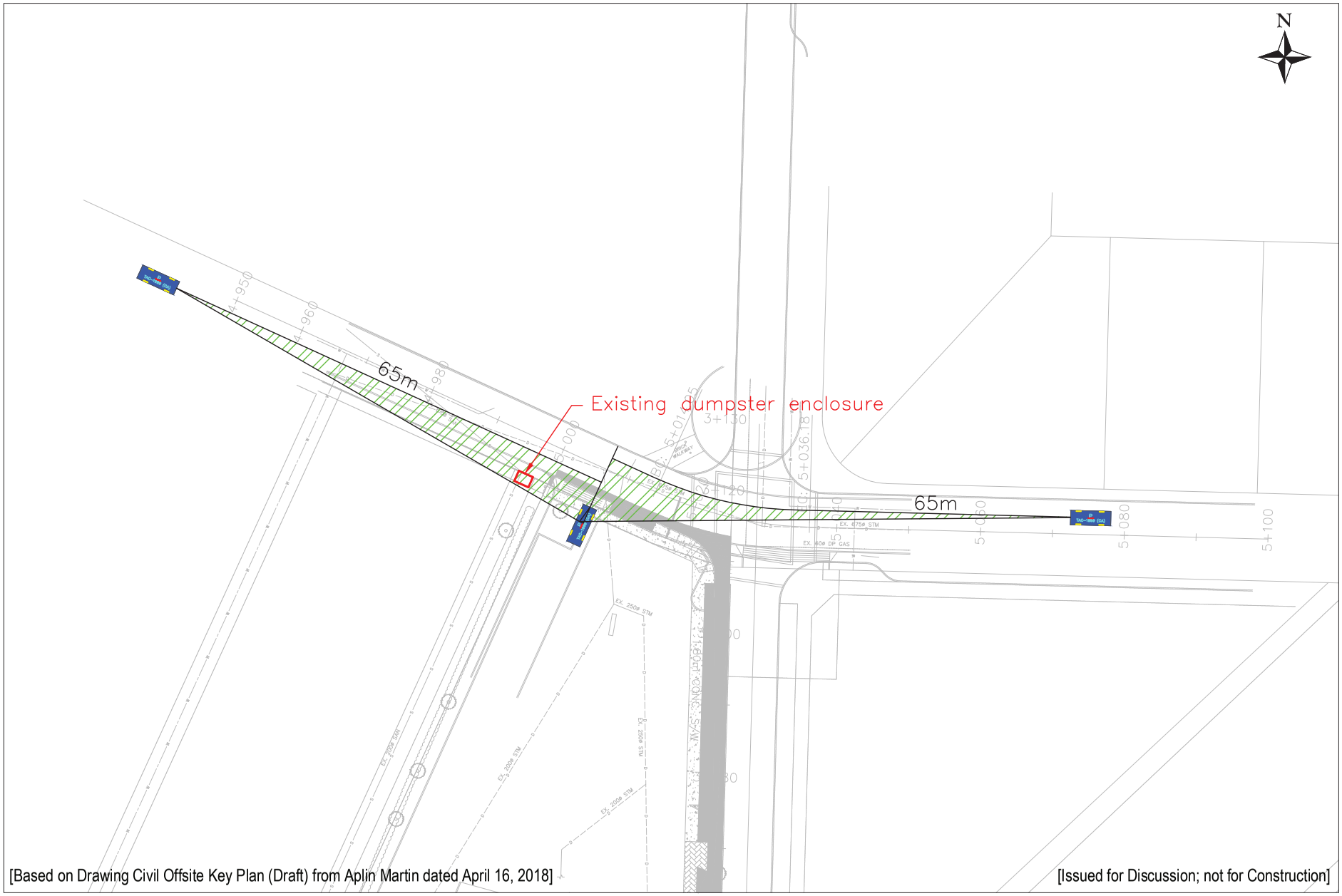

Exhibit 4.8

Stopping Sight Distance - 50 km/h

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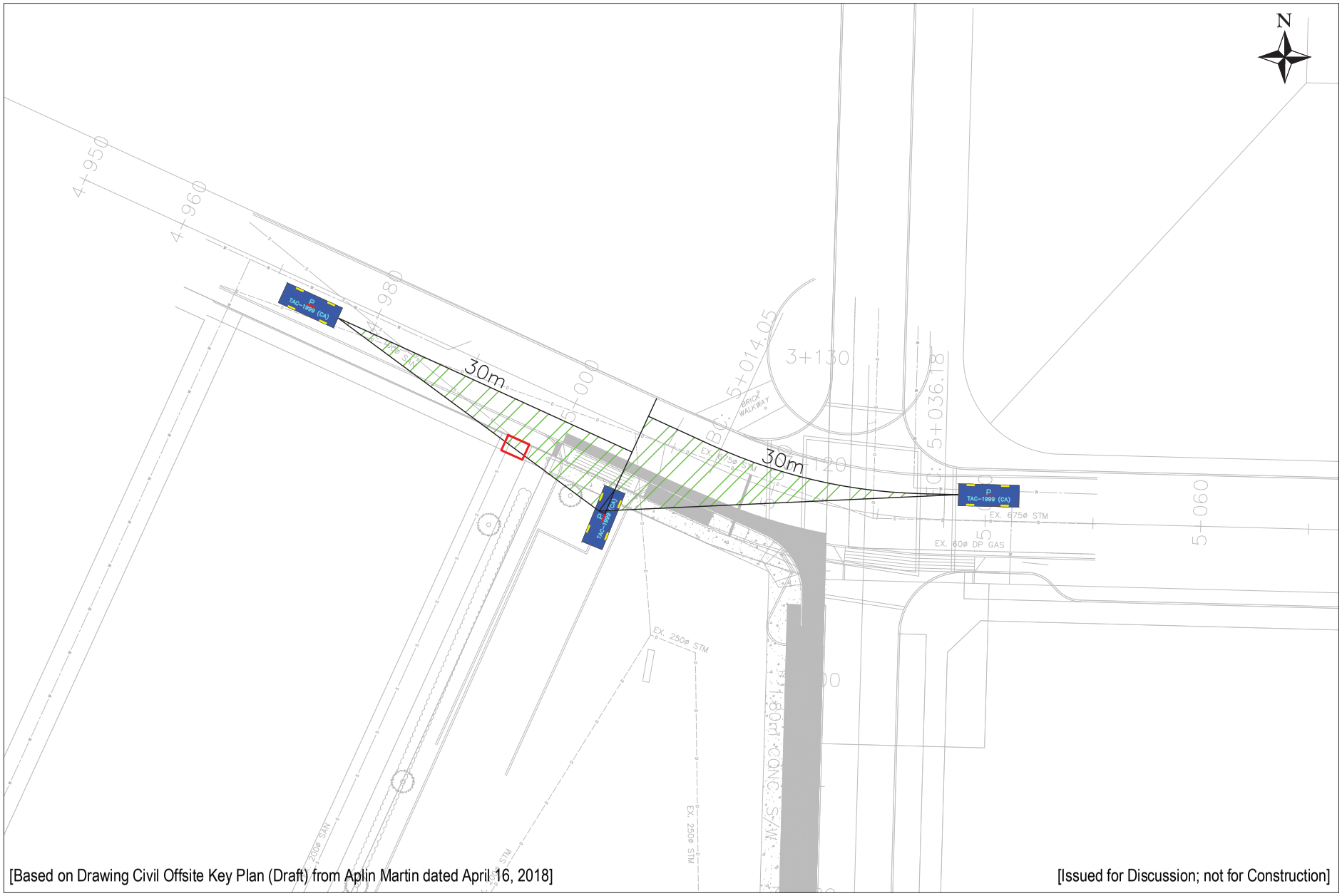
2018/04/20 14:01, Plotted by Nicolas Moss



[Based on Drawing Civil Offsite Key Plan (Draft) from Aplin Martin dated April 16, 2018]

[Issued for Discussion; not for Construction]

Exhibit 4.9

Stopping Sight Distance - 30 km/h

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2018/04/27 14:33, Plotted by Jordan Eccles

Exhibit 4.10

Intersection Sight Distance - 50 km/h

303 Marine Drive Update

04-17-0126 April 2018 Scale 1:1 000 on Letter Prepared by NM

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2018/04/27 14:33, Plotted by Jordan Eccles

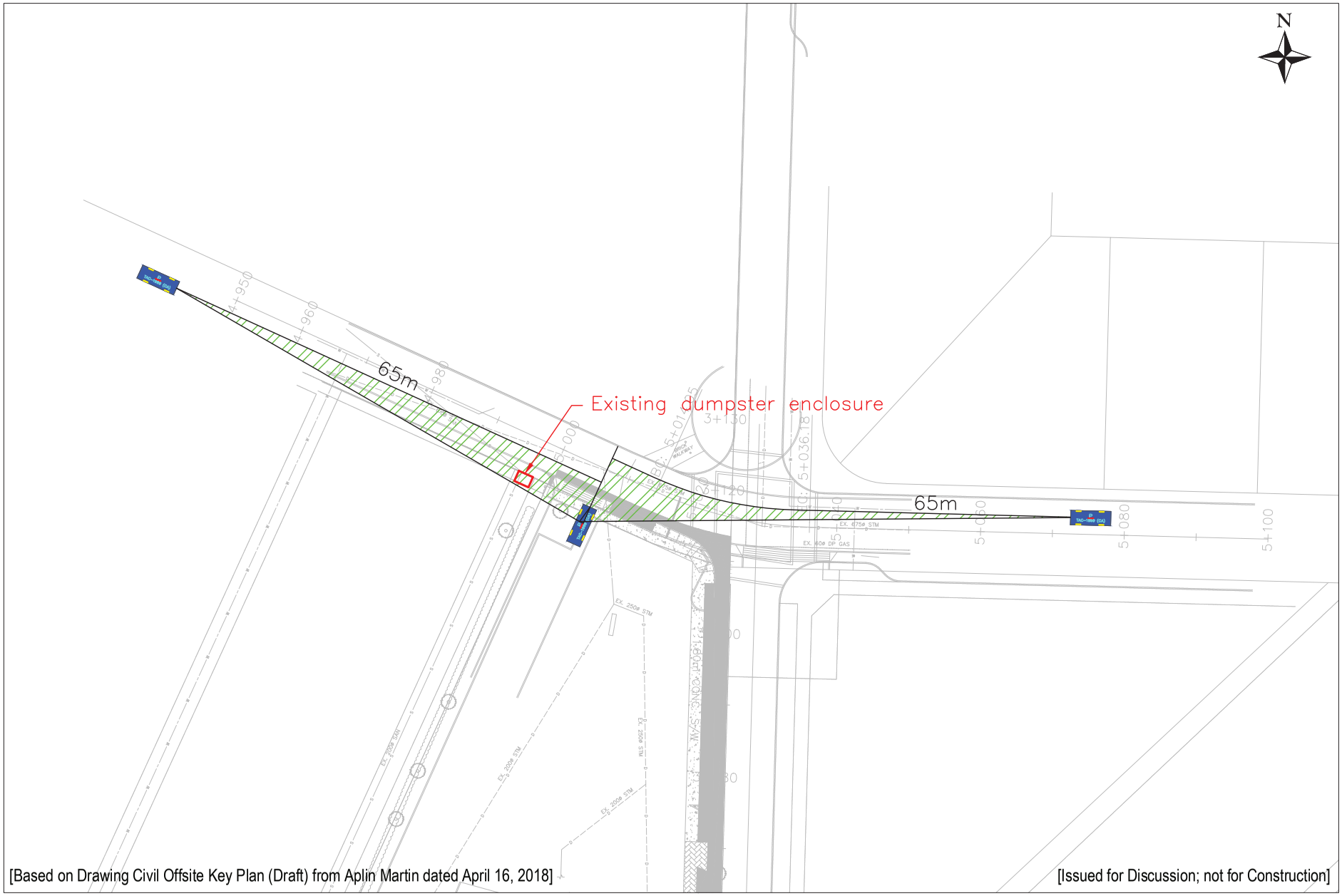

Exhibit 4.11

Intersection Sight Distance - 30 km/h

303 Marine Drive Update

04-17-0126 April 2018 Scale 1:750 on Letter Prepared by NM

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5. TDM & ACTIVE MODES

5.1 Definition

Transportation Demand Management (TDM) is defined as the "application of strategies and policies to reduce travel demand (specifically that of single-occupancy private vehicles), or to redistribute this demand in space or in time"[2]. A successful TDM program can influence travel behaviour away from Single Occupant Vehicle (SOV) travel during peak periods towards more sustainable modes such as High Occupancy Vehicle (HOV) travel, transit, cycling or walking. The responsibility for implementation of TDM measures can range across many groups, including regional and municipal governments, transit agencies, private developers, residents/resident associations or employers.

5.2 Potential Measures

Table 5.1 below summarizes possible suites of measures for residential land uses that, based on Bunt's research, may be appropriate for this site. The strategy is identified in the left column, and the measure in the centre column. The right column on the table shows which parties would be responsible for administering and managing the each initiative. While this is a comprehensive listing of all possible measures, the site developer's potential role in TDM for the site would be limited to those items identified as "Site Developer" on the far right of this table.

Table 5.1: Potential TDM Strategies Summary Table: Residential

STRATEGY	MEASURE	RESPONSIBILITY FOR IMPLEMENTATION
TDM Site Coordinator & Monitoring Program	Appoint a Site TDM Coordinator, responsible for developing, implementing and maintaining TDM program	Site Developer/Operator
	Establish mode split targets, monitoring methods and surveys and reporting	Site Operator/Strata
Marketing & Promotion	Prepare marketing materials to attract residents who want a car-free lifestyle	Site Developer
	Provide a Welcome Brochure, with an information package on transportation alternatives, that is issued to all new residents and posted in common areas	Site Developer/Site Operator
Cycling Infrastructure Improvements	Provide cycling facilities leading to, adjacent to and on the site	Site Developer, Municipality
	Provide safe, marked cycling crossings at intersections, with push button activation at signals	Municipality
Cycling Access	Provide a shared bicycle program	Site Developer/Operator
Cycling Amenities	Provide bicycle maps and way finding signage through site	Site Developer
	Provide a bicycle repair station	Site Developer
End of Trip Cycling Facilities	Provide long term secure and convenient bicycle storage facilities for residents	Site Developer
	Provide a common maintenance area for bicycle maintenance serving residents	Site Developer
	Provide short term bicycle rack parking at all building entrances (well lit and protected, within view of lobbies for residential	Site Developer

[2] http://ops.fhwa.dot.gov/tdm/index.htm FHWA Travel Demand Management home page

STRATEGY	MEASURE	RESPONSIBILITY FOR IMPLEMENTATION
	visitors and patrons)	
Pedestrian Infrastructure Improvements	Provide an off-street pathway system to minimize walking distances; provide sidewalks on both sides of all site and site fronting streets with boulevard improvements to buffer pedestrians from moving traffic	Site Developer
	Provide new protected pedestrian crossing opportunities and pushbuttons	Site Developer
Pedestrian Amenities	Provide amenities such as benches, fountains, etc. on the site and along the site frontages	Site Developer/Municipality
Rideshare Programs	Support resident use of available regional ride share programs	Site Developer/Operator, partnering with regional programs
Car Share	Provide Car Share vehicles and stalls for residents	Site Developer initiates with provision of vehicles and stalls, Car Share Program Provider operates and maintains program
	Provide Car Share stalls in publicly accessible area for site visitors and the neighbourhood	
	Provide initial Car Share membership fee for each unit	Site Developer
Transit	Provide funding for improvements to adjacent bus stops, such as benches and shelters at existing bus stops adjacent to site	Site Developer
	Provide subsidized transit passes to new residents upon move-in	Site Developer/Operator
	Provide a private shuttle service for residents to nearby key destinations	Site Developer/Operator
Parking Management	Require residents to pay for parking	
	Install pay parking on-street or in public parking lots to discourage off-site parking to avoid on-site parking fees	Municipality
	Restrict parking supply: provide lower than bylaw supply rates	Site Developer
	Unbundle Parking with Parking Rental Program (for rental units only)	Site Developer

5.3 Active Transportation Strategy

The Marine Drive Context Plan is a framework for the development of the Park Royal Area and the 303 Marine Drive area. The Plan notes specific context for Activity Transportation region wide and specifically for the subject site.

In regards to the Active Transportation Strategy, it notes that *"…the ability for pedestrians to safely, and comfortably, navigate east and west along paths would encourage pedestrian movements between. In addition, Marine Drive is an undesirable environment for pedestrians and cyclists and should be improved to encourage alternatives to vehicle travel."*

In regards to the subject site, the plan notes the anticipated building characteristics as a part of the larger context plan. Also, it indicates that there should be *"A north/south public space connection between Marine Drive and Klahanie Park to facilitate pedestrian mobility, and to increase the visibility between the park and Marine Drive."*

These points have been reflected in the proposed design of the site. Specifically, the improvement of Marine Drive immediately in front of the development and a Klahanie Park connection through the site are proposed.

With the site being the conduit between the Lower Capilano Marine Village Area and the West Vancouver / Park Royal, improved way-finding signage is suggested as part of the site to help direct pedestrian / bicycle traffic connecting the different locations.

5.3.1 Marketing Materials & Transportation Information

For Residents

Travel patterns are most pliable when residents move from one location to another. Therefore, site developers/rental companies can play a significant role in changing people's travel behaviours, through marketing materials to potential buyers/renters and through provision of information packages to new residents which stress the attractiveness and ease of alternative travel modes. In marketing materials to potential residents, clear and simple messages such as cost savings and health benefits (within the context of life style choice and urban living), along with practical information about local transit services, walking and cycle routes to key locations, carpooling and car-sharing services, would help attract residents who want to live a car-free lifestyle.

For residents who are moving in, a Transportation Information Package should be provided on move-in day. The package should include:

- A map showing amenities and shopping opportunities within a typical walking catchment of 800m;
- A map showing local cycling and transit routes with key destinations and travel times by different modes;
- Information about bicycle safety and local bicycle shops and repair facilities;
- Information pertaining to on-site car share provisions, car share membership sign up and procedures;
- Information pertaining to available bicycle and vehicle parking;
- Information on regional ride-share organizations, such as Jack Bell; and
- A list of websites and apps that can aid in the use of alternative transportation such as transit apps.

5.3.2 Walking

Walking is a realistic form of travel for most people, especially over short distances with many people willing to walk at least 5-minutes or 400m for short trips. Guidelines on the distances that people are willing to walk to for various trip purposes are set out in **Table 5.2**. This table focuses on land uses that can reasonably be accessed by walking from the site today.

Table 5.2: Walking Thresholds

FACILITY	THRESHOLD DISTANCES	FACILITIES OR USES WITHIN THRESHOLD DISTANCES OF THE DEVELOPMENT
Bus/Transit	400m	4 bus stops on Marine Drive and 2 bus stops on Capilano Road
Schools	600-1200m	Capilano Elementary School
Leisure Facilities	600-1200m	Klahanie Park, Evergreen Squash Club, Capilano Rugby Clubhouse, Steve Nash Fitness World, Future Community Centre at the Larco Development site, Norgate Park
Shops, restaurants, commercial	800-1200m	Marine Drive - Earls, Denny's, Pho Japolo & east to Bridgeman Avenue Capilano Road - Panago, Capilano Café, Capilano Market
Employment	2000m	Businesses at the proposed site, businesses along Capilano Road & on Marine Drive to Hamilton Ave

The distance that a person is willing to walk is often related to the purpose of the journey, but is also influenced by factors such as urban form, traffic, safety, personal fitness, car ownership, and parking availability.

Exhibit 5.1 highlights existing and current planned pedestrian connections to the site including the local amenities and services in the neighbourhood within an easy walk. Some of the primary destinations within a 10-minute walk from the site includes: Klahanie Park, Evergreen Club, Steve Nash Fitness World, as well as numerous restaurants and businesses.

Aside from the nearby destinations, the trail connecting the subject site to West Vancouver west of the Capilano River is less than 100m away. It takes just under 30 minutes to walk to Park Royal from the subject site.

In addition, the website Walk Score[3] is an online rating that estimates the walking, transit and cycling score of a location based on its' proximity to local services such as schools, restaurants, entertainment and other nearby amenities. Using this rating system, the site is currently classified as "Very Walkable" with a walking score of 70 out of 100 points, meaning that most errands can be accomplished on foot.

The site's transit score is rated 63 "Good Transit" and the bike score is rated 98 "Biker's Paradise" with "flat as a pancake" cycling routes and excellent facilities according to the website.

The proposed development site will be well located within walking distance to many amenities (and future amenities) along Marine Drive and Capilano Road. The nearby stores, retail and service amenities, parks, etc., will help encourage walking and cycling as realistic active modes of transport to/from the site.

[3] https://www.walkscore.com/score/303-marine-dr-n-vancouver-bc-canada

Furthermore, the proposed development addresses some of the overall objectives specified in the District of West Vancouver's June 2016 *Marine Drive Context Study*. For instance, the study identifies Marine Drive an "an undesirable environment for pedestrians and cyclists [that] should be improved to encourage alternatives to vehicle travel." In response, the development proposes to improve the adjacent section of Marine Drive. It currently contains a shared bike/bus lane but would be transformed to include a landscaped buffer, top-of-curb cycling lane, and widened sidewalk.

Secondly, the *Marine Drive Context Study* recognizes Klahanie Park as a "key community asset" and thus a goal is to "work towards creating additional ways to access the park from key pedestrian routes along primary streets." As such, the site plans to include a new 2-metre wide north-south pedestrian path on the site's east side to connect Marine Drive with Klahanie Park to its north.

Lastly, another of the study's objectives is to minimize trip generation by generally prioritizing residential uses. This site increases residential density in an area where people can meet their daily needs by foot or by bus, hence taking pressure off the road system.

5.3.3 Transit

When people are considering taking transit, their decision is typically based on a number of factors including their eligibility to drive, cost, convenience, relative journey times with other modes, personal choice, income level, etc. Generally, transit is a practical proposition for journeys of 4 kilometres and more, however if high frequency service is available, it is also practical for shorter distance trips for convenience.

The closest bus stop carrying buses between downtown Vancouver and the subject site is located east of the subject site in front of the current Grouse Inn development. This bus stop is expected to be improved as part of Grouse Inn re-development to provide adequate space to allow for two buses to queue one behind another. This improvement may help to service additional ridership by being able to provide shorter headways for buses at this location. In addition to the bus stopping area increasing in size, there will also be improvements to the bus waiting area. That includes a new bus shelter and having the bicycle path to be on top of curb rather than being shared with the bus lane.

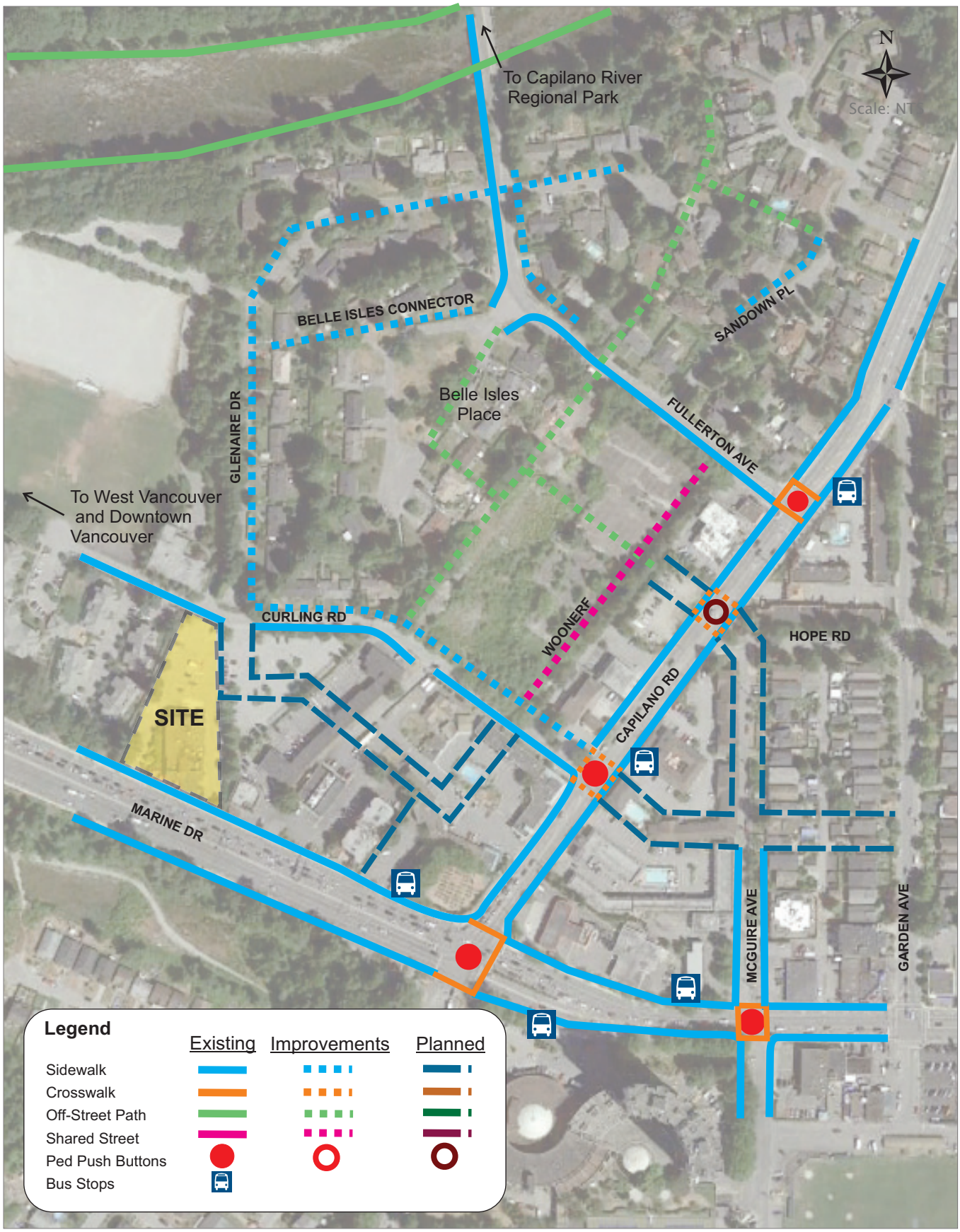

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Exhibit 5.1

Nearby Pedestrian Infrastructure

303 Marine Drive Update
04-17-0126 April 2018

bunt & associates

5.3.4 Cycling

Cyclists can generally travel 3 to 4 times the distance that pedestrians can travel over a similar period of time, suggesting 4-5 kilometres coverage for trips made to/from the site by bicycle. Cycling is increasingly becoming a more popular travel mode across Metro Vancouver for work and leisure, and improvements to cycling infrastructure in the District are helping make it both more convenient and safer for cyclists.

The average cycling speed for commuters is about 15 km/h, and the average distance per journey is approximately 5 km. This equates to an average journey time of 20 minutes. **Exhibit 5.2** highlights existing and planned bicycle connections to/on the site which include:

- Improvements along Marine Drive to modify the existing bike/bus shared lane into a separate top-of-curb cycling lane, widened pedestrian sidewalk, and landscaped buffer boulevard.
- Based on the District of North Vancouver's connectivity rationale, Curling Road will become a shared bicycle facility with vehicles.

Both these options will continue to connect to the Spirit Trail leading to Park Royal, with enhancements of the Marine Drive bike lane to be on top of curb (rather than being shared with the bus lane) and Curling Road fronting the site to have sharrows to indicate the corridor as a shared path.

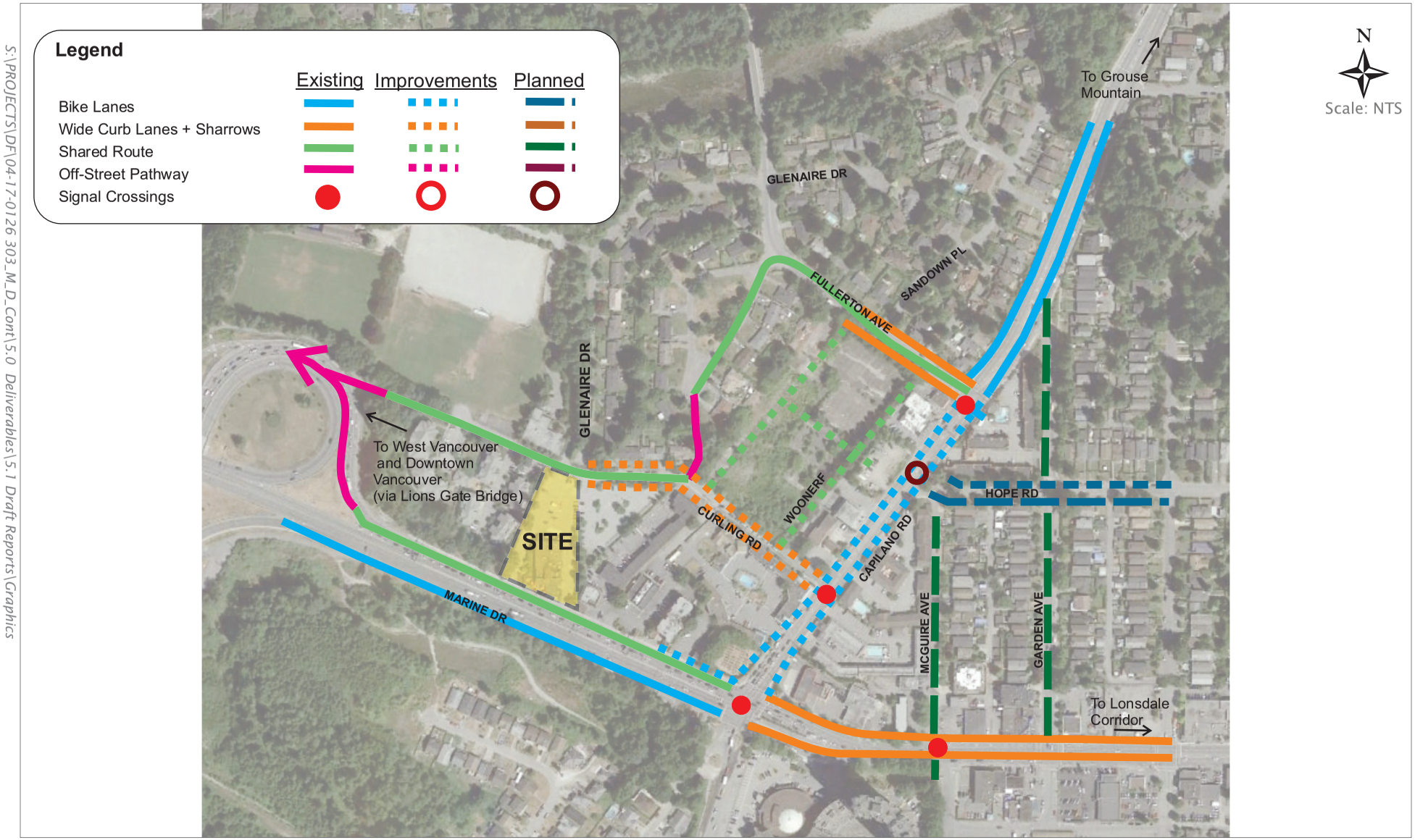

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Exhibit 5.2

Nearby Bicycle Connections

303 Marine Drive Update
04-17-0126 April 2018

bunt & associates

5.3.5 Car Share

Car-sharing services have developed significantly in the last 10-15 years (and increasingly in the past 2-3 years in Vancouver). These services allow people to have short term access to a shared vehicle located on or close to their site without having to buy or maintain their own vehicle. Members usually pay a small monthly administration fee to cover some of the fixed costs of the car, and then a "pay as you go" approach is adopted as members pay by the hour and mile when they use a vehicle. Each shared car has been shown to remove between 3 – 11 private vehicles from the street system, and number of vehicles owned per household was shown to drop when a car sharing membership was acquired[4].

There are two types of car sharing services – "A to B" type services such as Car2Go and Evo, and "A to B to A" type services such as Modo and Zipcar. In the former case, car share members can use vehicles from one origin to one destination and do not have to return these vehicles to the trip origin. The car share company repositions the cars regularly to respond to origin demand patterns. In the latter case, the vehicle's "home" position remains constant, and car share members must return the vehicles to their origin when they have finished using it. The two car share models are directed towards different users, and can complement each other when used at the same site. It is recommended the provision of a car share vehicle be explored at this site.

5.3.6 Unbundling Parking

Unbundling parking is a strategy where parking spaces are sold or rented separately from the unit. This increases prospective resident's choice to buy or rent a unit with or without a parking space. Residents which do not require a parking space have the opportunity for cost savings while residents that require additional parking spaces are required to consider the financial impact of parking multiple vehicles. Bunt has been informed that for the proposed development, the parking spaces allocated to the rental units will be unbundled.

[4] http://www.metrovancouver.org/services/regional-planning/PlanningPublications/MetroVancouverCarShareStudyTechnicalReport.pdf

6. CONCLUSIONS & RECOMMENDATIONS

Based on Bunt's review of the proposed development and its associated transportation impact, a summary of the conclusions and recommendations of the study is provided below.

6.1 Conclusions

6.1.1 Development Plan

- The proposed site is located at 303 Marine Drive and is an existing Earl's restaurant.
- The new proposed development is planned to be a mix of residential strata and rental units totaling 42 rental units, 4 townhomes, and 87 market residential units.
- The unit mix includes 1-bed, 2-bed, 3-bed, and townhomes.

6.1.2 Traffic Operations

- At build-out, the proposed development is anticipated to generate approximately 28 trips (5 in, 23 out) during the AM peak hour and 30 trips (19 in, 11 out) during the PM peak hour. Note that during the PM peak hours, the development trips and the Earl's restaurant trips are comparable. This means that with the reduction of the Earl's restaurant and with the addition of the subject development traffic, the total traffic on the street network will be about the same. As a side note, during the business peak hours, Earl's can generate more than 100 combined inbound and outbound trips, which exceeds the anticipated residential trips during the same time.
- Given the modest trip generation expected, the overall impact of the proposed development is expected to be a minimal 0.01 increase in Volume to Capacity (v/c) ratios at study area intersections for the 2020 an 2030 horizon years;
- In general, most intersection and individual movement Levels of Service after the build-out of the development are expected to be within acceptable parameters, while some individual movements will continue to exhibit operations exceeding desired performance thresholds;
- For the Marine Drive / Capilano Road intersection, the southbound right turn (during the AM peak hour), the eastbound left turn and the southbound left turn (during the PM peak period) are expected to experience long queues. These long queues are expected to be present regardless of the subject townhouse developments. The planned separate southbound through and left turn lanes, to be installed in conjunction with the Pacific Gate development, will improve southbound approach operations at this intersection;
- The intersection of Curling Road/Capilano Drive operates acceptably with good volume-to-capacity ratios. A northbound left protected/permitted phasing should be implemented in the 2020 scenario to minimize the likelihood of queues exceeding the short 20m storage bay. In the 2030 scenario and

with the addition of the Curling Road extension to McGuire Avenue, the movement could revert back to permissive phasing only and still maintain acceptable queues lengths.

6.1.3 Site Plan Review & Parking

- The site development is planned to include one access point connecting north from Klahanie Court; this driveway will provide access both to the residential and visitor underground parkade located at the western edge of the site and to surface parking and porte-cochere / layby to the lobby entrance.

- The total parking supply to be provided per rezoning application documents is 201 stalls, which exceeds the minimum parking requirements of 146 spaces per the District of West Vancouver's Marine Drive Local Area Plan and Design Guidelines.

- With the completion of the subject development and the associated access closure to Marine Drive, the interruption to westbound traffic flow on Marine Drive will be decreased. Also, operations for general traffic / bus / bicycles on Marine Drive will also be greatly improved.

- The developer is planning to provide 15 residential visitor bicycle parking spaces and 198 secured bicycle spaces for combined residential use. This equates to 213 bicycle spaces being provided for the 133 units. This provision is larger than the DNV bylaw minimum rate binding other projects in the Lower Capilano Marine Village Centre.

6.1.4 Transportation Demand Management & Active Modes

- This Darwin multi-family residential development is well located near the centre of the increasingly urban Lower Capilano Marine Village Centre. The site is in close proximity to the frequent transit network and pedestrian and cyclist networks around the site will be improved with the proposed development. These sustainable transportation options and features of the site will provide residents with modal choices and will help reduce the number of vehicle trips and parking demands at the site.

- A number of TDM measures are proposed to improve the ability of the future residents to take advantage of the nearby sustainable transportation infrastructure and to reduce their reliance on the automobile. The proposed TDM measures are as follows:

    - Promotion of the sustainable transportation features of the site during marketing phases;

    - Provision of a one-page sustainable transportation summary in the owner's manual for the residents;

    - Unbundling of rental parking spaces;

    - Provision of car share vehicle and stall;

    - Provision of a Bike (Repair) Room; and,

- Provision of sufficient secured bicycle parking spaces and supporting infrastructure for electric vehicles and bicycles;

6.2 Recommendations

- With the proposed traffic signal coordination, Bunt's traffic analysis and modelling indicates that optimized timing during peak demand periods would of the 2020 conditions be:
    - AM: 130 seconds for the Marine Drive / Capilano Road intersection; 130 seconds for the Curling Road / Capilano Road intersection; 65 seconds for the Fullerton Avenue / Capilano Road intersection; and,
    - PM: 130 seconds for the Marine Drive / Capilano Road intersection; 65 seconds for the Curling Road / Capilano Road intersection; 65 seconds for the Fullerton Avenue / Capilano Road intersection.
- With the coordination, Bunt's traffic analysis and modelling indicates that optimized timing during peak demand periods would of the 2030 conditions be:
    - AM: 130 seconds for the Marine Drive / Capilano Road intersection; 130 seconds for the Curling Road / Capilano Road intersection; 65 seconds for the McGuire Avenue / Capilano Road intersection; 65 seconds for the Fullerton Avenue / Capilano Road intersection; and,
    - PM: 130 seconds for the Marine Drive / Capilano Road intersection; 65 seconds for the Curling Road / Capilano Road intersection; 65 seconds for the Fullerton Avenue / Capilano Road intersection; and 65 seconds for the Fullerton Avenue / Capilano Road intersection.
- For Bunt studies, it was found that the general visitor parking rate for multifamily residential buildings would be in the order of 0.1 stalls / unit. As part of this study, the developer is providing in the order of 0.025 stalls / unit with surplus parking for residents. As there is surplus resident parking, it is expected that after the opening of the project, some visitors will be using resident parking instead. A management mechanism will be needed and is expected to be managed by the Strata.

APPENDIX A

Terms of Reference

Jordan Eccles

From: Daniel Fung
Sent: Thursday, October 12, 2017 6:25 PM
To: nwong@westvancouver.ca
Cc: Lisa Berg (lberg@westvancouver.ca); Kaylen Crosse; Jordan Eccles
Subject: 04-17-0126 303 Marine Drive Update TIA Terms of Reference

Hi Norm,

Please see below our anticipated terms of reference for the subject study:

- We will review a peak hour within the AM (7-9am) / PM (3-6pm) periods.
- The Marine Drive accesses for 303 Marine Drive will be assumed closed for the proposed site in the future. As such, the traffic impact assessment will reflect this change.
- Planning horizons of opening day (say 2020) and a + 10 year horizon (2030) will be analyzed for planning horizons of the traffic impact assessment. Note, the ultimate planning horizon will be kept for 2030 to be consistent with other studies in the area even if opening day is moved.
- The project team will need to contact MOTI for vetting the terms of reference since the site is within 800m of a controlled highway access.
- We will include traffic information of developments in the nearby area already submitted to the District of North Vancouver and are public information.
- We will provide rationale for background growth estimates in addition development generated trips (further information below).
- We will try and gather the information for the Travelodge re-development. However, the traffic study may not be available now and we may have to find other ways to estimate the amount of traffic for that development. We will keep you informed of progress for estimating the site traffic.
- We will study the Marine Drive / Capilano, Curling Road / Capilano, and Fullerton Road / Capilano intersections along with the site access.
- We will review the site plan as it pertains to parking, firetruck, and loading circulations (where applicable).
- We will review parking requirements for the site per West Vancouver's zoning bylaw.

As noted in our discussion before, we will not be re-counting the study intersections as we have counts from October 2015 which we are continuing to use as a basis of analysis for the Capilano Corridor for all studies currently being completed by Bunt. As for the background growth rate, to be consistent with previous neighbourhood planning work and other TIAs in the study area, Bunt will assume a 1% blanket growth rate for both AM and PM peak hour. The expectations to this blanket growth rate application were the movements to/from the Lions Gate Bridge which in our view are at saturation levels in the morning peak period. Consequently, no growth in background traffic was assumed for the AM peak hour only at the Marine Drive / Capilano Road intersection, for the southbound right turn and the westbound through movements and for the PM only at the Marine Drive / Capilano intersction, for the eastbound left turn (and through) movements (as well as any downstream movements). For these movements, onsite observations during our count program indicated they are saturated and therefore, additional traffic volumes could not be process through the intersection. As a side note, growth will be applied only to the through volumes for the Capilano Road corridor so not to double count growth from the side streets (based on redevelopment traffic).

Should you have any questions / comments, please let me know.

Daniel Fung, M.Sc., P.Eng. | Senior Transportation Engineer

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APPENDIX B

Synchro Reports

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	172	143	60	416	1645
Future Volume (vph)	172	143	60	416	1645
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.4	12.9	28.9
Total Split (s)	26.6	26.6	8.4	38.4	30.0
Total Split (%)	40.9%	40.9%	12.9%	59.1%	46.2%
Yellow Time (s)	3.3	3.3	3.4	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.4	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	12.1	12.1	43.9	41.4	35.3
Actuated g/C Ratio	0.19	0.19	0.68	0.64	0.54
v/c Ratio	0.55	0.36	0.22	0.19	0.93
Control Delay	29.7	6.8	12.9	1.3	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	6.8	12.9	1.3	28.3
LOS	C	A	B	A	C
Approach Delay	19.3			2.7	28.3
Approach LOS	B			A	C

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 31 (48%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 22.3	Intersection LOS: C
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

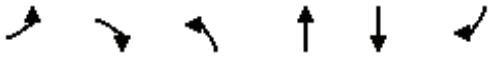
Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	181	151	63	438	1790
v/c Ratio	0.55	0.36	0.22	0.19	0.93
Control Delay	29.7	6.8	12.9	1.3	28.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.7	6.8	12.9	1.3	28.3
Queue Length 50th (m)	20.0	0.0	3.7	2.5	~115.4
Queue Length 95th (m)	33.7	11.7	11.1	4.0	#188.0
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	608	291	2280	1933
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.32	0.25	0.22	0.19	0.93

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



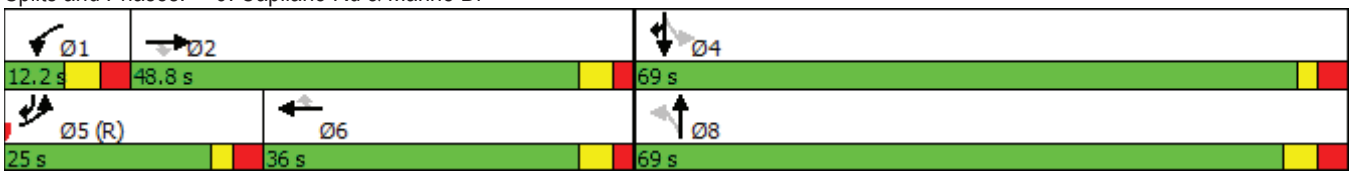
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	172	143	60	416	1645	55
Future Volume (vph)	172	143	60	416	1645	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1789	3579	3557	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1773	1567	202	3579	3557	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	181	151	63	438	1732	58
RTOR Reduction (vph)	0	123	0	0	3	0
Lane Group Flow (vph)	181	28	63	438	1787	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	12.1	12.1	41.4	41.4	33.9	
Effective Green, g (s)	12.1	12.1	41.4	41.4	33.9	
Actuated g/C Ratio	0.19	0.19	0.64	0.64	0.52	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	330	291	228	2279	1855	
v/s Ratio Prot			c0.02	0.12	c0.50	
v/s Ratio Perm	c0.10	0.02	0.16			
v/c Ratio	0.55	0.10	0.28	0.19	0.96	
Uniform Delay, d1	24.0	21.9	12.5	4.9	15.0	
Progression Factor	1.00	1.00	2.61	0.20	1.00	
Incremental Delay, d2	1.9	0.2	0.7	0.2	13.9	
Delay (s)	25.9	22.1	33.4	1.2	28.8	
Level of Service	C	C	C	A	C	
Approach Delay (s)	24.2			5.2	28.8	
Approach LOS	C			A	C	

Intersection Summary			
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	71.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	657	113	17	926	63	24	68	30	63	36	1638
Future Volume (vph)	375	657	113	17	926	63	24	68	30	63	36	1638
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	26.5	26.5	11.4	30.5	30.5	41.4	41.4		35.4	35.4	
Total Split (s)	25.0	48.8	48.8	12.2	36.0	36.0	69.0	69.0		69.0	69.0	
Total Split (%)	19.2%	37.5%	37.5%	9.4%	27.7%	27.7%	53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	2.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4		2.0	2.0	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0	
Total Lost Time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4			5.0	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Max	Min	Min	None	Min	Min	None	None		None	None	
Act Effct Green (s)	22.8	52.8	52.8	5.6	29.9	29.9	60.5	60.5	130.0		61.9	89.6
Actuated g/C Ratio	0.18	0.41	0.41	0.04	0.23	0.23	0.47	0.47	1.00		0.48	0.69
v/c Ratio	0.55	0.46	0.17	0.24	0.84	0.17	0.04	0.08	0.02		0.15	0.86
Control Delay	53.4	31.1	5.9	68.1	55.7	0.9	18.2	18.8	0.0		21.3	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
Total Delay	53.4	31.1	5.9	68.1	55.7	0.9	18.2	18.8	0.0		21.3	15.1
LOS	D	C	A	E	E	A	B	B	A		C	B
Approach Delay		35.9			52.5			14.0			15.5	
Approach LOS		D			D			B			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 85	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 30.6	Intersection LOS: C
Intersection Capacity Utilization 120.4%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	383	670	115	17	945	64	24	69	31	101	1671
v/c Ratio	0.55	0.46	0.17	0.24	0.84	0.17	0.04	0.08	0.02	0.15	0.86
Control Delay	53.4	31.1	5.9	68.1	55.7	0.9	18.2	18.8	0.0	21.3	15.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.4	31.1	5.9	68.1	55.7	0.9	18.2	18.8	0.0	21.3	15.1
Queue Length 50th (m)	46.5	62.7	0.0	4.3	84.7	0.0	3.2	9.3	0.0	13.8	97.4
Queue Length 95th (m)	62.4	93.1	12.9	12.3	101.4	0.0	8.0	17.7	0.0	m25.2	100.3
Internal Link Dist (m)		205.6			64.4			105.4		101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0		
Base Capacity (vph)	692	1452	684	75	1146	392	627	906	1535	696	1933
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.46	0.17	0.23	0.82	0.16	0.04	0.08	0.02	0.15	0.86

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	375	657	113	17	926	63	24	68	30	63	36	1638
Future Volume (vph)	375	657	113	17	926	63	24	68	30	63	36	1638
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4	4.0		5.0	5.0
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.94	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535		1708	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.69	1.00	1.00		0.80	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1303	1883	1535		1414	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	383	670	115	17	945	64	24	69	31	64	37	1671
RTOR Reduction (vph)	0	0	72	0	0	47	0	0	0	0	0	7
Lane Group Flow (vph)	383	670	43	17	945	17	24	69	31	0	101	1664
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	18.9	48.9	48.9	2.3	33.7	33.7	60.5	60.5	130.0		61.9	85.8
Effective Green, g (s)	18.9	48.9	48.9	2.3	33.7	33.7	60.5	60.5	130.0		61.9	85.8
Actuated g/C Ratio	0.15	0.38	0.38	0.02	0.26	0.26	0.47	0.47	1.00		0.48	0.66
Clearance Time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4			5.0	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	574	1346	571	30	1266	329	606	876	1535		673	1859
v/s Ratio Prot	0.10	0.19		0.01	c0.19			0.04				c0.59
v/s Ratio Perm			0.03			0.01	0.02		0.02		0.07	
v/c Ratio	0.67	0.50	0.08	0.57	0.75	0.05	0.04	0.08	0.02		0.15	0.90
Uniform Delay, d1	52.6	31.1	26.0	63.4	44.2	36.1	18.9	19.3	0.0		19.2	18.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.11	0.68
Incremental Delay, d2	6.0	0.3	0.1	18.4	2.4	0.1	0.0	0.0	0.0		0.1	5.0
Delay (s)	58.6	31.4	26.1	81.7	46.7	36.2	19.0	19.3	0.0		21.5	17.5
Level of Service	E	C	C	F	D	D	B	B	A		C	B
Approach Delay (s)		39.8			46.6			14.4			17.7	
Approach LOS		D			D			B			B	

Intersection Summary			
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	120.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	NBL	NBT	SBT
Lane Configurations				
Traffic Volume (vph)	16	26	484	1726
Future Volume (vph)	16	26	484	1726
Turn Type	Perm	Perm	NA	NA
Protected Phases			8	4
Permitted Phases	2	8		
Detector Phase	2	8	8	4
Switch Phase				
Minimum Initial (s)	4.0	4.0	4.0	4.0
Minimum Split (s)	24.7	21.0	21.0	23.0
Total Split (s)	26.0	104.0	104.0	104.0
Total Split (%)	20.0%	80.0%	80.0%	80.0%
Yellow Time (s)	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.0	5.0	5.0
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	7.0	112.3	112.3	112.3
Actuated g/C Ratio	0.05	0.86	0.86	0.86
v/c Ratio	0.28	0.16	0.16	0.60
Control Delay	46.4	5.5	1.3	4.8
Queue Delay	0.0	0.0	0.0	1.0
Total Delay	46.4	5.5	1.3	5.7
LOS	D	A	A	A
Approach Delay	46.4		1.6	5.7
Approach LOS	D		A	A

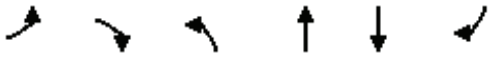
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 93 (72%), Referenced to phase 4:SBT and 8:NBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 5.3	Intersection LOS: A
Intersection Capacity Utilization 60.8%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd

Lane Group	EBL	NBL	NBT	SBT
Lane Group Flow (vph)	29	27	509	1845
v/c Ratio	0.28	0.16	0.16	0.60
Control Delay	46.4	5.5	1.3	4.8
Queue Delay	0.0	0.0	0.0	1.0
Total Delay	46.4	5.5	1.3	5.7
Queue Length 50th (m)	4.3	0.7	6.3	34.0
Queue Length 95th (m)	14.0	m3.9	8.6	m70.1
Internal Link Dist (m)	40.4		101.6	45.2
Turn Bay Length (m)		20.0		
Base Capacity (vph)	279	171	3091	3085
Starvation Cap Reductn	0	0	0	876
Spillback Cap Reductn	0	0	0	58
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.16	0.16	0.84

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	16	11	26	484	1726	27
Future Volume (vph)	16	11	26	484	1726	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7		5.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.94		1.00	1.00	1.00	
Flt Protected	0.97		0.95	1.00	1.00	
Satd. Flow (prot)	1728		1789	3579	3570	
Flt Permitted	0.97		0.10	1.00	1.00	
Satd. Flow (perm)	1728		197	3579	3570	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	17	12	27	509	1817	28
RTOR Reduction (vph)	11	0	0	0	0	0
Lane Group Flow (vph)	18	0	27	509	1845	0
Turn Type	Perm		Perm	NA	NA	
Protected Phases				8	4	
Permitted Phases	2		8			
Actuated Green, G (s)	7.0		112.3	112.3	112.3	
Effective Green, g (s)	7.0		112.3	112.3	112.3	
Actuated g/C Ratio	0.05		0.86	0.86	0.86	
Clearance Time (s)	5.7		5.0	5.0	5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0	
Lane Grp Cap (vph)	93		170	3091	3083	
v/s Ratio Prot				0.14	c0.52	
v/s Ratio Perm	c0.01		0.14			
v/c Ratio	0.19		0.16	0.16	0.60	
Uniform Delay, d1	58.8		1.4	1.4	2.5	
Progression Factor	1.00		2.06	0.84	1.65	
Incremental Delay, d2	1.0		1.8	0.1	0.4	
Delay (s)	59.8		4.7	1.3	4.5	
Level of Service	E		A	A	A	
Approach Delay (s)	59.8			1.5	4.5	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	42.2	37.5	27.9	23.3	24.7	171.5	166.2
Average Queue (m)	28.4	21.7	12.0	4.3	5.7	92.3	81.5
95th Queue (m)	44.0	38.2	23.1	15.3	16.9	168.4	156.0
Link Distance (m)	39.8			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	2	0					
Queuing Penalty (veh)	8	0					
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	7	2					
Queuing Penalty (veh)	11	3					

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	60.2	56.2	77.3	79.9	56.7	59.1	81.0	95.3	96.4	44.0	67.2	61.8
Average Queue (m)	39.1	34.0	45.7	44.7	8.2	7.0	68.7	88.3	86.7	29.5	47.6	42.9
95th Queue (m)	56.8	52.7	68.0	67.5	28.0	29.9	79.2	99.2	102.5	60.4	82.2	80.4
Link Distance (m)	208.9	208.9	208.9	208.9			67.8	67.8	67.8		56.1	56.1
Upstream Blk Time (%)						0	11	55	58		26	24
Queuing Penalty (veh)						0	37	185	194		130	120
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				2	0	0	19		71	0		
Queuing Penalty (veh)				2	0	0	3		45	0		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	SB	SB	SB
Directions Served	L	T	LT	R	R
Maximum Queue (m)	41.8	22.6	76.8	99.9	103.9
Average Queue (m)	12.4	9.8	23.8	75.1	76.5
95th Queue (m)	34.2	20.6	61.8	109.8	110.6
Link Distance (m)	109.4	109.4		95.2	95.2
Upstream Blk Time (%)				2	2
Queuing Penalty (veh)				15	16
Storage Bay Dist (m)			65.0		
Storage Blk Time (%)				10	
Queuing Penalty (veh)				10	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	LR	L	T	T	T	TR	T	T
Maximum Queue (m)	22.8	16.2	14.4	15.6	71.2	71.3	14.5	10.3
Average Queue (m)	8.2	4.5	2.7	3.2	39.4	40.5	1.0	0.8
95th Queue (m)	18.7	13.0	10.2	11.9	68.0	68.8	7.2	7.1
Link Distance (m)	39.6		95.2	95.2	51.0	51.0	12.5	12.5
Upstream Blk Time (%)					3	3	0	0
Queuing Penalty (veh)					25	28	4	4
Storage Bay Dist (m)		20.0						
Storage Blk Time (%)		0	0					
Queuing Penalty (veh)		0	0					

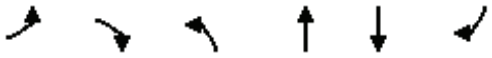
Zone Summary

Zone wide Queuing Penalty: 841

3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	68	76	185	1229	827
v/c Ratio	0.30	0.28	0.34	0.46	0.42
Control Delay	28.5	9.9	4.5	5.0	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	9.9	4.5	5.0	10.0
Queue Length 50th (m)	7.6	0.0	6.0	30.5	28.1
Queue Length 95th (m)	16.9	9.6	14.9	48.9	48.4
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	557	553	2686	1987
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.12	0.14	0.33	0.46	0.42

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	65	72	176	1168	691	95
Future Volume (vph)	65	72	176	1168	691	95
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1788	3579	3499	
Flt Permitted	0.95	1.00	0.28	1.00	1.00	
Satd. Flow (perm)	1773	1567	527	3579	3499	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	76	185	1229	727	100
RTOR Reduction (vph)	0	68	0	0	12	0
Lane Group Flow (vph)	68	8	185	1229	815	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	7.0	7.0	46.5	46.5	35.6	
Effective Green, g (s)	7.0	7.0	46.5	46.5	35.6	
Actuated g/C Ratio	0.11	0.11	0.72	0.72	0.55	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	190	168	522	2560	1916	
v/s Ratio Prot			0.04	c0.34	0.23	
v/s Ratio Perm	c0.04	0.01	0.21			
v/c Ratio	0.36	0.05	0.35	0.48	0.43	
Uniform Delay, d1	26.9	26.0	3.4	4.0	8.7	
Progression Factor	1.00	1.00	1.18	1.05	1.00	
Incremental Delay, d2	1.2	0.1	0.4	0.5	0.7	
Delay (s)	28.2	26.1	4.4	4.8	9.4	
Level of Service	C	C	A	A	A	
Approach Delay (s)	27.1			4.7	9.4	
Approach LOS	C			A	A	

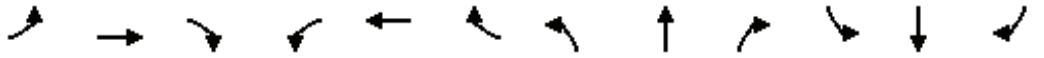
Intersection Summary			
HCM 2000 Control Delay	7.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	54.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

9: Capilano Rd & Marine Dr

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	1179	1113	242	48	716	145	174	259	31	235	566
v/c Ratio	0.70	0.56	0.26	0.47	0.78	0.43	0.81	0.53	0.02	0.96	0.27
Control Delay	35.1	21.9	5.1	73.3	56.6	14.9	71.8	44.7	0.0	82.9	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	35.1	21.9	5.1	73.3	56.6	14.9	71.8	44.7	0.0	82.9	6.3
Queue Length 50th (m)	128.1	101.7	5.7	12.0	63.9	4.5	40.9	56.0	0.0	44.3	10.7
Queue Length 95th (m)	160.4	132.8	20.6	24.9	78.7	23.3	#70.2	78.8	0.0	#95.3	31.3
Internal Link Dist (m)		205.6			64.4			105.4		101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0		
Base Capacity (vph)	1675	1997	934	122	958	348	254	573	1535	288	2059
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	818
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.56	0.26	0.39	0.75	0.42	0.69	0.45	0.02	0.82	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1073	1013	220	44	652	132	158	236	28	113	101	515
Future Volume (vph)	1073	1013	220	44	652	132	158	236	28	113	101	515
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4	4.0		5.0	5.0
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00		1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.96	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00		0.97	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535		1770	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.44	1.00	1.00		0.50	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	834	1883	1535		917	2818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1179	1113	242	48	716	145	174	259	31	124	111	566
RTOR Reduction (vph)	0	0	89	0	0	99	0	0	0	0	0	6
Lane Group Flow (vph)	1179	1113	153	48	716	46	174	259	31	0	235	560
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	53.8	71.3	71.3	6.9	25.8	25.8	33.5	33.5	130.0		34.9	93.7
Effective Green, g (s)	53.8	71.3	71.3	6.9	25.8	25.8	33.5	33.5	130.0		34.9	93.7
Actuated g/C Ratio	0.41	0.55	0.55	0.05	0.20	0.20	0.26	0.26	1.00		0.27	0.72
Clearance Time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4			5.0	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0			3.0	
Lane Grp Cap (vph)	1636	1962	833	90	969	252	214	485	1535		246	2031
v/s Ratio Prot	c0.30	0.31		0.03	c0.15			0.14				0.20
v/s Ratio Perm			0.10			0.04	0.21		0.02		c0.26	
v/c Ratio	0.72	0.57	0.18	0.53	0.74	0.18	0.81	0.53	0.02		0.96	0.28
Uniform Delay, d1	31.8	19.2	14.7	60.0	48.9	43.3	45.3	41.5	0.0		46.8	6.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		0.77	0.99
Incremental Delay, d2	2.8	0.4	0.1	4.7	3.0	0.3	20.5	1.1	0.0		43.6	0.1
Delay (s)	34.6	19.6	14.8	64.6	51.9	43.7	65.8	42.7	0.0		79.9	6.3
Level of Service	C	B	B	E	D	D	E	D	A		E	A
Approach Delay (s)		26.1			51.3			48.5			27.9	
Approach LOS		C			D			D			C	

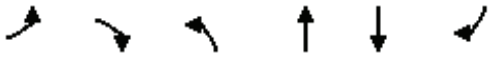
Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	NBL	NBT	SBT
Lane Group Flow (vph)	91	64	1452	798
v/c Ratio	0.38	0.12	0.56	0.35
Control Delay	18.7	1.3	4.3	4.6
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	18.7	1.3	4.4	4.6
Queue Length 50th (m)	4.5	0.6	11.4	12.3
Queue Length 95th (m)	15.2	m1.6	27.0	18.5
Internal Link Dist (m)	40.4		101.6	45.2
Turn Bay Length (m)		20.0		
Base Capacity (vph)	533	537	2583	2257
Starvation Cap Reductn	0	0	290	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.17	0.12	0.63	0.35

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	38	48	61	1379	678	80
Future Volume (vph)	38	48	61	1379	678	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7		3.0	5.0	5.0	
Lane Util. Factor	1.00		1.00	0.95	0.95	
Frt	0.92		1.00	1.00	0.98	
Flt Protected	0.98		0.95	1.00	1.00	
Satd. Flow (prot)	1704		1789	3579	3522	
Flt Permitted	0.98		0.31	1.00	1.00	
Satd. Flow (perm)	1704		575	3579	3522	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	40	51	64	1452	714	84
RTOR Reduction (vph)	45	0	0	0	9	0
Lane Group Flow (vph)	46	0	64	1452	789	0
Turn Type	Perm		pm+pt	NA	NA	
Protected Phases			3	8	4	
Permitted Phases	2		8			
Actuated Green, G (s)	7.4		46.9	46.9	40.3	
Effective Green, g (s)	7.4		46.9	46.9	40.3	
Actuated g/C Ratio	0.11		0.72	0.72	0.62	
Clearance Time (s)	5.7		3.0	5.0	5.0	
Vehicle Extension (s)	3.0		2.5	3.0	3.0	
Lane Grp Cap (vph)	193		482	2582	2183	
v/s Ratio Prot			0.01	c0.41	0.22	
v/s Ratio Perm	c0.03		0.09			
v/c Ratio	0.24		0.13	0.56	0.36	
Uniform Delay, d1	26.2		2.9	4.2	6.0	
Progression Factor	1.00		0.42	0.80	0.64	
Incremental Delay, d2	0.6		0.1	0.7	0.4	
Delay (s)	26.9		1.3	4.1	4.3	
Level of Service	C		A	A	A	
Approach Delay (s)	26.9			4.0	4.3	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	5.0	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	30.8	24.8	53.5	67.2	70.9	66.4	48.6
Average Queue (m)	12.7	9.8	20.3	32.6	37.3	33.6	24.5
95th Queue (m)	24.4	18.8	39.0	62.0	66.3	59.4	47.3
Link Distance (m)	39.8			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	0	0			0		
Queuing Penalty (veh)	0	0			0		
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	0	0	0	1			
Queuing Penalty (veh)	0	0	2	1			

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	163.8	160.8	116.8	117.5	67.5	29.7	71.2	91.5	92.6	44.0	31.7	28.3
Average Queue (m)	99.6	96.0	63.1	63.2	28.8	12.1	53.9	64.6	57.4	31.4	3.0	2.3
95th Queue (m)	150.8	146.4	97.8	100.3	72.5	25.5	74.0	90.0	84.7	55.8	20.8	17.0
Link Distance (m)	208.9	208.9	208.9	208.9			67.8	67.8	67.8		56.1	56.1
Upstream Blk Time (%)	0	0					1	6	5		0	0
Queuing Penalty (veh)	1	1					1	18	14		1	0
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				8	0		1		26	1		
Queuing Penalty (veh)				17	0		1		35	2		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB
Directions Served	L	T	R	LT	R	R
Maximum Queue (m)	80.2	79.3	33.6	76.4	86.4	77.9
Average Queue (m)	37.6	40.4	4.7	51.4	28.5	22.5
95th Queue (m)	68.7	67.8	26.2	81.9	80.1	62.6
Link Distance (m)	109.4	109.4			95.2	95.2
Upstream Blk Time (%)					7	1
Queuing Penalty (veh)					24	4
Storage Bay Dist (m)			35.0	65.0		
Storage Blk Time (%)		17	0	17	0	
Queuing Penalty (veh)		5	0	44	0	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	LR	L	T	T	T	TR	T	T
Maximum Queue (m)	30.4	26.4	43.1	48.0	62.0	59.1	10.7	9.8
Average Queue (m)	13.0	8.7	22.6	26.2	27.1	20.1	1.4	0.5
95th Queue (m)	23.9	20.0	42.9	46.4	55.1	46.4	11.1	5.8
Link Distance (m)	39.6		95.2	95.2	51.0	51.0	12.5	12.5
Upstream Blk Time (%)	0				5	1	2	0
Queuing Penalty (veh)	0				19	3	9	1
Storage Bay Dist (m)		20.0						
Storage Blk Time (%)		0	6					
Queuing Penalty (veh)		1	3					

Zone Summary

Zone wide Queuing Penalty: 209

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	192	240	99	466	1650
Future Volume (vph)	192	240	99	466	1650
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.4	12.9	28.9
Total Split (s)	26.6	26.6	8.4	38.4	30.0
Total Split (%)	40.9%	40.9%	12.9%	59.1%	46.2%
Yellow Time (s)	3.3	3.3	3.4	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.4	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	12.9	12.9	43.1	40.6	32.2
Actuated g/C Ratio	0.20	0.20	0.66	0.62	0.50
v/c Ratio	0.57	0.54	0.34	0.22	1.02
Control Delay	29.2	11.0	13.6	1.6	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.0	13.6	1.6	49.2
LOS	C	B	B	A	D
Approach Delay	19.1			3.7	49.2
Approach LOS	B			A	D

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 34 (52%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 35.0	Intersection LOS: D
Intersection Capacity Utilization 79.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: Capilano Rd & Fullerton Ave

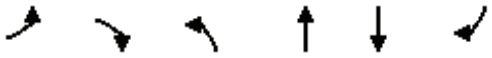
3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	200	250	103	485	1804
v/c Ratio	0.57	0.54	0.34	0.22	1.02
Control Delay	29.2	11.0	13.6	1.6	49.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.0	13.6	1.6	49.2
Queue Length 50th (m)	22.0	6.2	7.7	5.2	~131.7
Queue Length 95th (m)	35.7	21.2	10.5	6.8	#197.1
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	634	305	2235	1764
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.39	0.34	0.22	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



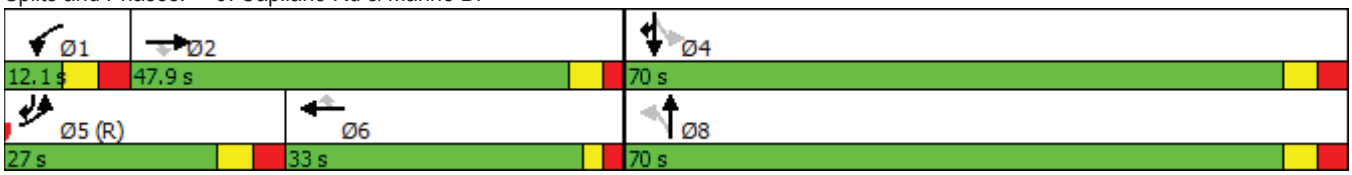
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	192	240	99	466	1650	82
Future Volume (vph)	192	240	99	466	1650	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1789	3579	3548	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1773	1567	215	3579	3548	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	200	250	103	485	1719	85
RTOR Reduction (vph)	0	151	0	0	5	0
Lane Group Flow (vph)	200	99	103	485	1799	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	12.9	12.9	40.6	40.6	31.6	
Effective Green, g (s)	12.9	12.9	40.6	40.6	31.6	
Actuated g/C Ratio	0.20	0.20	0.62	0.62	0.49	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	351	310	269	2235	1724	
v/s Ratio Prot			c0.03	0.14	c0.51	
v/s Ratio Perm	c0.11	0.06	0.21			
v/c Ratio	0.57	0.32	0.38	0.22	1.04	
Uniform Delay, d1	23.5	22.3	12.7	5.3	16.7	
Progression Factor	1.00	1.00	2.28	0.23	1.00	
Incremental Delay, d2	2.2	0.6	0.9	0.2	34.1	
Delay (s)	25.7	22.9	29.8	1.4	50.8	
Level of Service	C	C	C	A	D	
Approach Delay (s)	24.2			6.4	50.8	
Approach LOS	C			A	D	

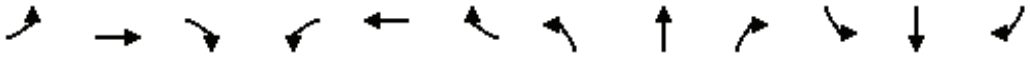
Intersection Summary			
HCM 2000 Control Delay	37.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	676	116	17	907	103	25	78	30	143	58	1776
Future Volume (vph)	430	676	116	17	907	103	25	78	30	143	58	1776
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	29.1	29.1	41.4	41.4		13.4	13.4	
Total Split (s)	27.0	47.9	47.9	12.1	33.0	33.0	70.0	70.0		70.0	70.0	
Total Split (%)	20.8%	36.8%	36.8%	9.3%	25.4%	25.4%	53.8%	53.8%		53.8%	53.8%	
Yellow Time (s)	3.4	3.4	3.4	3.4	2.0	2.0	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		Max	Max	
Act Effct Green (s)	20.6	49.0	49.0	5.5	28.2	28.2	64.3	64.3	130.0	64.3	64.3	91.3
Actuated g/C Ratio	0.16	0.38	0.38	0.04	0.22	0.22	0.49	0.49	1.00	0.49	0.49	0.70
v/c Ratio	0.70	0.51	0.18	0.24	0.87	0.27	0.04	0.09	0.02	0.25	0.06	0.91
Control Delay	58.6	33.8	6.0	68.3	59.2	4.7	17.6	18.0	0.0	23.1	19.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9
Total Delay	58.6	33.8	6.0	68.3	59.2	4.7	17.6	18.0	0.0	23.1	19.4	76.5
LOS	E	C	A	E	E	A	B	B	A	C	B	E
Approach Delay		39.9			53.9			13.9			71.0	
Approach LOS		D			D			B			E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.91	
Intersection Signal Delay: 56.5	Intersection LOS: E
Intersection Capacity Utilization 102.8%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	439	690	118	17	926	105	26	80	31	146	59	1812
v/c Ratio	0.70	0.51	0.18	0.24	0.87	0.27	0.04	0.09	0.02	0.25	0.06	0.91
Control Delay	58.6	33.8	6.0	68.3	59.2	4.7	17.6	18.0	0.0	23.1	19.4	30.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9
Total Delay	58.6	33.8	6.0	68.3	59.2	4.7	17.6	18.0	0.0	23.1	19.4	76.5
Queue Length 50th (m)	53.9	66.0	0.0	4.3	84.0	0.0	3.4	10.6	0.0	25.6	8.6	223.8
Queue Length 95th (m)	70.9	97.2	13.2	12.3	100.7	8.1	8.4	19.4	0.0	m35.6	m11.6	252.1
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	65.0		
Base Capacity (vph)	626	1348	646	74	1085	388	669	931	1535	590	931	1985
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	462
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.51	0.18	0.23	0.85	0.27	0.04	0.09	0.02	0.25	0.06	1.19

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	430	676	116	17	907	103	25	78	30	143	58	1776
Future Volume (vph)	430	676	116	17	907	103	25	78	30	143	58	1776
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4	4.0	6.4	6.4	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1611	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1353	1883	1535	1195	1883	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	439	690	118	17	926	105	26	80	31	146	59	1812
RTOR Reduction (vph)	0	0	77	0	0	79	0	0	0	0	0	7
Lane Group Flow (vph)	439	690	41	17	926	26	26	80	31	146	59	1805
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	16.7	45.1	45.1	2.3	32.1	32.1	64.3	64.3	130.0	64.3	64.3	87.4
Effective Green, g (s)	16.7	45.1	45.1	2.3	32.1	32.1	64.3	64.3	130.0	64.3	64.3	87.4
Actuated g/C Ratio	0.13	0.35	0.35	0.02	0.25	0.25	0.49	0.49	1.00	0.49	0.49	0.67
Clearance Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	508	1241	527	30	1206	313	669	931	1535	591	931	1894
v/s Ratio Prot	0.11	0.19		0.01	c0.19			0.04			0.03	c0.64
v/s Ratio Perm			0.03			0.02	0.02		0.02	0.12		
v/c Ratio	0.86	0.56	0.08	0.57	0.77	0.08	0.04	0.09	0.02	0.25	0.06	0.95
Uniform Delay, d1	55.5	34.3	28.5	63.4	45.5	37.6	16.9	17.3	0.0	18.9	17.1	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.14	1.10	1.49
Incremental Delay, d2	17.5	0.5	0.1	18.4	3.0	0.1	0.0	0.0	0.0	0.7	0.1	9.5
Delay (s)	73.1	34.9	28.6	81.7	48.5	37.7	17.0	17.4	0.0	22.3	18.9	38.4
Level of Service	E	C	C	F	D	D	B	B	A	C	B	D
Approach Delay (s)		47.7			47.9			13.4			36.7	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	41.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	102.8%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	52	185	75	535	1792
Future Volume (vph)	52	185	75	535	1792
Turn Type	Perm	Perm	Perm	NA	NA
Protected Phases				8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	8	8	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	12.0	12.0	19.0
Total Split (s)	25.0	25.0	105.0	105.0	105.0
Total Split (%)	19.2%	19.2%	80.8%	80.8%	80.8%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	17.0	17.0	102.3	102.3	102.3
Actuated g/C Ratio	0.13	0.13	0.79	0.79	0.79
v/c Ratio	0.24	0.83	0.64	0.20	0.68
Control Delay	52.4	71.5	40.1	1.1	10.4
Queue Delay	0.0	0.7	0.0	0.3	1.1
Total Delay	52.4	72.2	40.1	1.5	11.6
LOS	D	E	D	A	B
Approach Delay	67.8			6.2	11.6
Approach LOS	E			A	B

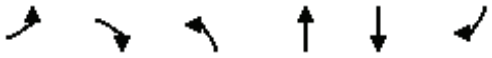
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 126 (97%), Referenced to phase 4:SBT and 8:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization 80.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	54	191	77	552	1900
v/c Ratio	0.24	0.83	0.64	0.20	0.68
Control Delay	52.4	71.5	40.1	1.1	10.4
Queue Delay	0.0	0.7	0.0	0.3	1.1
Total Delay	52.4	72.2	40.1	1.5	11.6
Queue Length 50th (m)	12.3	37.9	11.6	4.6	135.3
Queue Length 95th (m)	25.0	#72.0	m#24.3	5.0	m133.7
Internal Link Dist (m)	40.4			101.6	45.2
Turn Bay Length (m)	30.0		20.0		
Base Capacity (vph)	251	256	121	2816	2795
Starvation Cap Reductn	0	0	0	1624	601
Spillback Cap Reductn	0	6	0	0	585
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.22	0.76	0.64	0.46	0.87

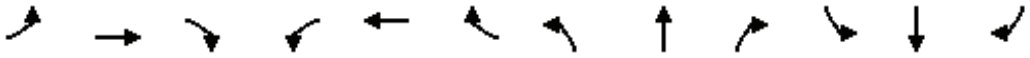
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	52	185	75	535	1792	51
Future Volume (vph)	52	185	75	535	1792	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1697	1501	1789	3579	3550	
Flt Permitted	0.95	1.00	0.08	1.00	1.00	
Satd. Flow (perm)	1697	1501	154	3579	3550	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	54	191	77	552	1847	53
RTOR Reduction (vph)	0	34	0	0	1	0
Lane Group Flow (vph)	54	157	77	552	1899	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	Perm	NA	NA	
Protected Phases				8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	17.0	17.0	102.3	102.3	102.3	
Effective Green, g (s)	17.0	17.0	102.3	102.3	102.3	
Actuated g/C Ratio	0.13	0.13	0.79	0.79	0.79	
Clearance Time (s)	5.7	5.7	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	221	196	121	2816	2793	
v/s Ratio Prot				0.15	c0.53	
v/s Ratio Perm	0.03	c0.10	0.50			
v/c Ratio	0.24	0.80	0.64	0.20	0.68	
Uniform Delay, d1	50.7	54.9	5.9	3.5	6.3	
Progression Factor	1.00	1.00	1.89	0.26	1.45	
Incremental Delay, d2	0.6	20.5	19.7	0.1	0.5	
Delay (s)	51.3	75.4	30.9	1.1	9.7	
Level of Service	D	E	C	A	A	
Approach Delay (s)	70.1			4.7	9.7	
Approach LOS	E			A	A	

Intersection Summary			
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	80.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	14	0	15	17	2	0	0	21	13	0	0
Future Volume (Veh/h)	0	14	0	15	17	2	0	0	21	13	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	15	0	16	18	2	0	0	22	14	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	20			15			66	67	15	88	66	19
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	20			15			66	67	15	88	66	19
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	98	100	100
cM capacity (veh/h)	1596			1603			920	815	1065	872	816	1059

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	36	22	14
Volume Left	0	16	0	14
Volume Right	0	2	22	0
cSH	1596	1603	1065	872
Volume to Capacity	0.00	0.01	0.02	0.02
Queue Length 95th (m)	0.0	0.2	0.5	0.4
Control Delay (s)	0.0	3.3	8.5	9.2
Lane LOS		A	A	A
Approach Delay (s)	0.0	3.3	8.5	9.2
Approach LOS			A	A

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	22.6%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	55.2	37.5	46.9	36.9	29.0	305.8	305.6
Average Queue (m)	31.4	29.2	16.3	7.6	12.2	296.0	295.9
95th Queue (m)	51.7	41.4	38.9	22.3	24.1	302.0	301.7
Link Distance (m)	41.7			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	5	1				75	92
Queuing Penalty (veh)	20	0				0	0
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	7	9	0				
Queuing Penalty (veh)	17	18	1				

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	197.0	201.3	184.2	180.9	67.1	61.6	73.2	97.5	91.0	44.0	66.3	61.6
Average Queue (m)	146.0	143.0	70.6	63.7	9.4	5.2	63.7	82.6	78.4	31.2	28.7	25.2
95th Queue (m)	256.4	260.5	162.4	140.9	37.9	22.8	76.1	99.7	101.9	57.9	70.8	67.1
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		56.1	56.1
Upstream Blk Time (%)	41	38	3	0		0	5	31	39		8	12
Queuing Penalty (veh)	125	115	8	0		0	19	105	135		42	60
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				3	0	0	9		45	20		
Queuing Penalty (veh)				4	0	0	1		46	59		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	19.7	57.2	33.4	48.5	54.9	105.2	106.7
Average Queue (m)	5.3	18.7	3.9	21.0	10.7	79.6	82.3
95th Queue (m)	15.2	46.0	23.8	39.5	37.6	102.6	104.8
Link Distance (m)	109.4	109.4			92.4	92.4	92.4
Upstream Blk Time (%)						1	1
Queuing Penalty (veh)						6	9
Storage Bay Dist (m)			35.0	65.0			
Storage Blk Time (%)		9	0		0		
Queuing Penalty (veh)		3	0		0		

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	29.5	39.8	31.9	98.8	99.7	69.0	82.0	7.5	36.5
Average Queue (m)	12.0	19.6	30.1	82.3	19.1	26.2	69.3	0.4	25.7
95th Queue (m)	26.5	33.8	35.0	126.3	71.4	65.6	86.7	3.8	45.4
Link Distance (m)		37.9		92.4	92.4	50.8	50.8	12.5	12.5
Upstream Blk Time (%)	0	1		54	2	3	20	0	18
Queuing Penalty (veh)	0	2		165	5	23	185	1	163
Storage Bay Dist (m)	30.0		20.0						
Storage Blk Time (%)	1	2	95	3					
Queuing Penalty (veh)	2	1	253	2					

Intersection: 99: Curling Rd

Movement	NB	SB
Directions Served	LTR	LTR
Maximum Queue (m)	11.8	8.3
Average Queue (m)	4.5	2.5
95th Queue (m)	12.1	8.6
Link Distance (m)	26.7	251.3
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1596

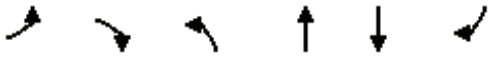
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	103	143	298	1190	736
Future Volume (vph)	103	143	298	1190	736
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.3	12.9	28.9
Total Split (s)	26.6	26.6	9.0	38.4	29.4
Total Split (%)	40.9%	40.9%	13.8%	59.1%	45.2%
Yellow Time (s)	3.3	3.3	3.3	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.3	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	9.7	9.7	46.4	43.8	26.2
Actuated g/C Ratio	0.15	0.15	0.71	0.67	0.40
v/c Ratio	0.41	0.42	0.55	0.52	0.64
Control Delay	29.1	8.5	14.4	9.6	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	8.5	14.4	9.6	17.9
LOS	C	A	B	A	B
Approach Delay	17.1			10.6	17.9
Approach LOS	B			B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 10 (15%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	108	151	314	1253	912
v/c Ratio	0.41	0.42	0.55	0.52	0.64
Control Delay	29.1	8.5	14.4	9.6	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	8.5	14.4	9.6	17.9
Queue Length 50th (m)	12.0	0.0	40.8	91.0	41.4
Queue Length 95th (m)	23.4	12.6	55.2	85.0	65.7
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	608	571	2412	1420
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.25	0.55	0.52	0.64

Intersection Summary



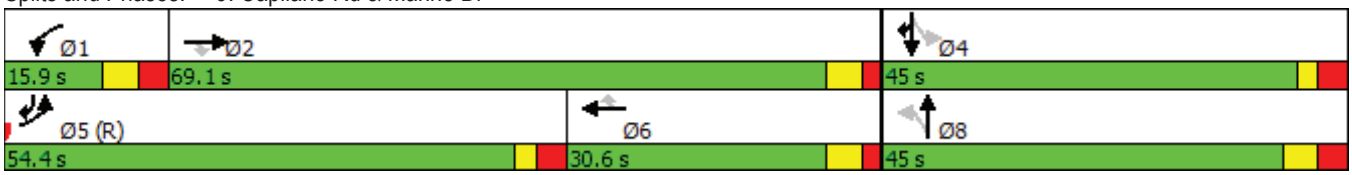
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	143	298	1190	736	130
Future Volume (vph)	103	143	298	1190	736	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.3	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1788	3579	3480	
Flt Permitted	0.95	1.00	0.19	1.00	1.00	
Satd. Flow (perm)	1773	1567	358	3579	3480	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	151	314	1253	775	137
RTOR Reduction (vph)	0	128	0	0	21	0
Lane Group Flow (vph)	108	23	314	1253	891	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	9.7	9.7	43.8	43.8	26.1	
Effective Green, g (s)	9.7	9.7	43.8	43.8	26.1	
Actuated g/C Ratio	0.15	0.15	0.67	0.67	0.40	
Clearance Time (s)	5.6	5.6	3.3	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	264	233	558	2411	1397	
v/s Ratio Prot			c0.12	0.35	c0.26	
v/s Ratio Perm	c0.06	0.01	0.25			
v/c Ratio	0.41	0.10	0.56	0.52	0.64	
Uniform Delay, d1	25.1	23.9	6.4	5.3	15.6	
Progression Factor	1.00	1.00	2.47	1.58	1.00	
Incremental Delay, d2	1.1	0.2	1.1	0.7	2.2	
Delay (s)	26.2	24.1	16.8	9.1	17.9	
Level of Service	C	C	B	A	B	
Approach Delay (s)	24.9			10.6	17.9	
Approach LOS	C			B	B	

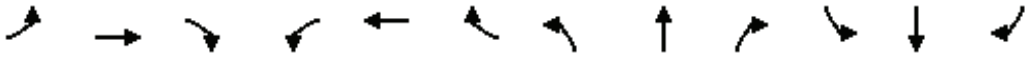
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	63.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1185	1043	227	45	664	219	165	265	28	177	125	586
Future Volume (vph)	1185	1043	227	45	664	219	165	265	28	177	125	586
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	26.5	26.5	11.4	30.5	30.5	41.4	41.4		35.4	35.4	
Total Split (s)	54.4	69.1	69.1	15.9	30.6	30.6	45.0	45.0		45.0	45.0	
Total Split (%)	41.8%	53.2%	53.2%	12.2%	23.5%	23.5%	34.6%	34.6%		34.6%	34.6%	
Yellow Time (s)	2.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4		2.0	2.0	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	1.4	
Total Lost Time (s)	6.9	5.5	5.5	6.4	5.5	5.5	6.4	6.4		5.0	6.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Max	Min	Min	None	Min	Min	None	None		None	None	
Act Effct Green (s)	51.0	70.2	70.2	8.0	24.4	24.4	35.8	35.8	130.0	37.2	35.8	95.1
Actuated g/C Ratio	0.39	0.54	0.54	0.06	0.19	0.19	0.28	0.28	1.00	0.29	0.28	0.73
v/c Ratio	0.84	0.59	0.27	0.47	0.80	0.71	0.54	0.56	0.02	0.97	0.26	0.31
Control Delay	42.6	23.5	5.3	73.3	57.7	36.0	46.1	44.4	0.0	91.1	28.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	42.6	23.5	5.3	73.3	57.7	36.0	46.1	44.4	0.0	91.1	28.8	3.8
LOS	D	C	A	E	E	D	D	D	A	F	C	A
Approach Delay		31.1			53.3			42.3			24.8	
Approach LOS		C			D			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.97	
Intersection Signal Delay: 35.3	Intersection LOS: D
Intersection Capacity Utilization 108.2%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1302	1146	249	49	730	241	181	291	31	195	137	644
v/c Ratio	0.84	0.59	0.27	0.47	0.80	0.71	0.54	0.56	0.02	0.97	0.26	0.31
Control Delay	42.6	23.5	5.3	73.3	57.7	36.0	46.1	44.4	0.0	91.1	28.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	42.6	23.5	5.3	73.3	57.7	36.0	46.1	44.4	0.0	91.1	28.8	3.8
Queue Length 50th (m)	156.7	111.4	6.5	12.3	65.6	28.2	38.4	62.1	0.0	49.1	20.3	9.2
Queue Length 95th (m)	#187.1	136.2	21.2	25.4	80.7	58.7	61.7	90.1	0.0	#96.2	32.9	19.8
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	65.0		
Base Capacity (vph)	1552	1933	912	124	943	345	360	559	1535	216	559	2054
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	781
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.59	0.27	0.40	0.77	0.70	0.50	0.52	0.02	0.90	0.25	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1185	1043	227	45	664	219	165	265	28	177	125	586
Future Volume (vph)	1185	1043	227	45	664	219	165	265	28	177	125	586
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.9	5.5	5.5	6.4	5.5	5.5	6.4	6.4	4.0	5.0	6.4	5.0
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1679	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.64	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1213	1883	1535	703	1883	2818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1302	1146	249	49	730	241	181	291	31	195	137	644
RTOR Reduction (vph)	0	0	94	0	0	99	0	0	0	0	0	6
Lane Group Flow (vph)	1302	1146	155	49	730	142	181	291	31	195	137	638
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	51.6	68.9	68.9	7.0	25.7	25.7	35.8	35.8	130.0	37.2	37.2	93.8
Effective Green, g (s)	49.7	68.9	68.9	7.0	25.7	25.7	35.8	35.8	130.0	37.2	35.8	93.8
Actuated g/C Ratio	0.38	0.53	0.53	0.05	0.20	0.20	0.28	0.28	1.00	0.29	0.28	0.72
Clearance Time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1512	1896	805	91	965	251	334	518	1535	201	518	2033
v/s Ratio Prot	c0.33	0.32		0.03	c0.15			0.15			0.07	0.23
v/s Ratio Perm			0.10			0.11	0.15		0.02	c0.28		
v/c Ratio	0.86	0.60	0.19	0.54	0.76	0.56	0.54	0.56	0.02	0.97	0.26	0.31
Uniform Delay, d1	37.0	21.1	16.0	59.9	49.2	47.1	40.1	40.4	0.0	45.9	36.8	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.77	0.53
Incremental Delay, d2	6.7	0.5	0.1	4.7	3.4	2.9	1.8	1.4	0.0	52.3	0.3	0.1
Delay (s)	43.6	21.7	16.1	64.6	52.6	50.0	41.9	41.8	0.0	88.3	28.5	3.5
Level of Service	D	C	B	E	D	D	D	D	A	F	C	A
Approach Delay (s)		31.8			52.6			39.2			24.0	
Approach LOS		C			D			D			C	

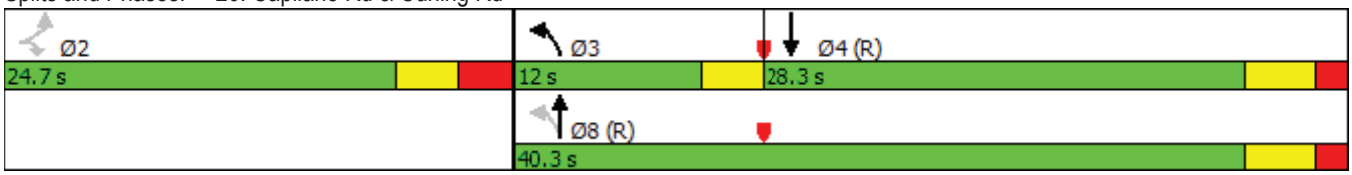
Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	108.2%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	70	110	188	1482	766
Future Volume (vph)	70	110	188	1482	766
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			3	8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	3	8	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	7.0	7.0
Minimum Split (s)	24.7	24.7	8.0	12.0	19.0
Total Split (s)	24.7	24.7	12.0	40.3	28.3
Total Split (%)	38.0%	38.0%	18.5%	62.0%	43.5%
Yellow Time (s)	3.0	3.0	3.0	3.4	3.4
All-Red Time (s)	2.7	2.7	0.0	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	3.0	5.0	5.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	Min	Min	None	C-Max	C-Max
Act Effct Green (s)	8.2	8.2	48.1	46.1	35.7
Actuated g/C Ratio	0.13	0.13	0.74	0.71	0.55
v/c Ratio	0.34	0.39	0.41	0.61	0.48
Control Delay	29.4	10.0	5.2	3.9	2.5
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	29.4	10.0	5.2	4.1	2.5
LOS	C	A	A	A	A
Approach Delay	17.5			4.2	2.5
Approach LOS	B			A	A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 25 (38%), Referenced to phase 4:SBT and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 4.6	Intersection LOS: A
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

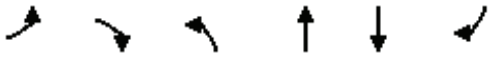
Splits and Phases: 20: Capilano Rd & Curling Rd



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	74	116	198	1560	919
v/c Ratio	0.34	0.39	0.41	0.61	0.48
Control Delay	29.4	10.0	5.2	3.9	2.5
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	29.4	10.0	5.2	4.1	2.5
Queue Length 50th (m)	8.3	0.0	2.3	18.5	4.2
Queue Length 95th (m)	17.9	11.6	m11.8	43.3	10.0
Internal Link Dist (m)	40.4			101.6	45.2
Turn Bay Length (m)	30.0		20.0		
Base Capacity (vph)	509	532	523	2539	1921
Starvation Cap Reductn	0	0	0	314	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.15	0.22	0.38	0.70	0.48

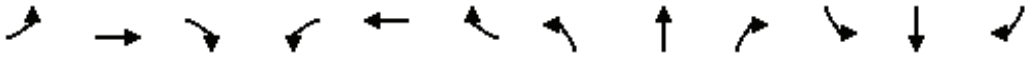
Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	70	110	188	1482	766	107
Future Volume (vph)	70	110	188	1482	766	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	3.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.96	1.00	1.00	0.99	
Flpb, ped/bikes	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1743	1541	1785	3579	3479	
Flt Permitted	0.95	1.00	0.24	1.00	1.00	
Satd. Flow (perm)	1743	1541	451	3579	3479	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	74	116	198	1560	806	113
RTOR Reduction (vph)	0	101	0	0	12	0
Lane Group Flow (vph)	74	15	198	1560	907	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			3	8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	8.2	8.2	46.1	46.1	35.6	
Effective Green, g (s)	8.2	8.2	46.1	46.1	35.6	
Actuated g/C Ratio	0.13	0.13	0.71	0.71	0.55	
Clearance Time (s)	5.7	5.7	3.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	2.5	3.0	3.0	
Lane Grp Cap (vph)	219	194	473	2538	1905	
v/s Ratio Prot			0.05	c0.44	0.26	
v/s Ratio Perm	c0.04	0.01	0.25			
v/c Ratio	0.34	0.08	0.42	0.61	0.48	
Uniform Delay, d1	25.9	25.1	4.0	4.9	9.0	
Progression Factor	1.00	1.00	1.32	0.61	0.18	
Incremental Delay, d2	0.9	0.2	0.3	0.7	0.7	
Delay (s)	26.8	25.2	5.5	3.7	2.3	
Level of Service	C	C	A	A	A	
Approach Delay (s)	25.9			3.9	2.3	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.9	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	28	0	25	89	12	0	0	36	9	2	0
Future Volume (Veh/h)	0	28	0	25	89	12	0	0	36	9	2	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	29	0	26	94	13	0	0	38	9	2	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	107			29			182	188	29	220	182	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	107			29			182	188	29	220	182	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	96	99	100	100
cM capacity (veh/h)	1484			1584			767	695	1046	701	701	955

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	133	38	11
Volume Left	0	26	0	9
Volume Right	0	13	38	0
cSH	1484	1584	1046	701
Volume to Capacity	0.00	0.02	0.04	0.02
Queue Length 95th (m)	0.0	0.4	0.9	0.4
Control Delay (s)	0.0	1.5	8.6	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	1.5	8.6	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	27.4%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	41.2	33.9	57.3	81.2	82.5	149.2	163.7
Average Queue (m)	18.6	17.9	39.4	53.2	54.9	56.3	73.9
95th Queue (m)	34.8	32.9	63.3	84.5	83.8	138.4	155.9
Link Distance (m)	41.7			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	0	0		1	1		0
Queuing Penalty (veh)	1	0		5	5		0
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	2	1	4	4			
Queuing Penalty (veh)	3	1	26	13			

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	207.8	208.6	152.4	155.1	67.5	41.8	73.9	90.8	92.8	44.0	49.7	56.9
Average Queue (m)	163.7	159.5	73.3	71.6	21.7	10.2	58.2	69.8	69.5	40.9	11.0	13.4
95th Queue (m)	237.6	237.5	155.2	149.0	63.6	26.2	75.7	93.4	100.1	52.6	42.1	48.4
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		56.1	56.1
Upstream Blk Time (%)	11	10	1	0		0	2	14	23		1	2
Queuing Penalty (veh)	70	62	3	1		0	5	44	71		5	10
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				6	0	0	2		34	24		
Queuing Penalty (veh)				14	0	0	1		75	54		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	114.9	109.3	42.5	77.0	105.4	101.1	99.5
Average Queue (m)	72.4	53.5	7.7	63.7	69.6	35.5	31.5
95th Queue (m)	126.0	99.0	34.1	97.5	131.9	94.6	84.2
Link Distance (m)	109.4	109.4			92.4	92.4	92.4
Upstream Blk Time (%)	19	4			28	4	1
Queuing Penalty (veh)	0	0			83	11	3
Storage Bay Dist (m)			35.0	65.0			
Storage Blk Time (%)		26	0	53	2		
Queuing Penalty (veh)		7	0	67	3		

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	26.7	26.5	31.8	91.3	86.1	73.6	72.3	28.5	28.4
Average Queue (m)	11.0	11.5	27.5	55.3	52.7	38.7	47.8	7.2	8.0
95th Queue (m)	23.4	20.8	38.5	79.8	75.9	83.2	84.2	26.5	28.7
Link Distance (m)		37.9		92.4	92.4	50.8	50.8	12.5	12.5
Upstream Blk Time (%)	0	0		0	0	26	19	18	10
Queuing Penalty (veh)	0	0		0	0	114	81	78	42
Storage Bay Dist (m)	30.0		20.0						
Storage Blk Time (%)	0	0	21	17					
Queuing Penalty (veh)	0	0	158	33					

Intersection: 99: Curling Rd

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	4.8	17.9	9.7
Average Queue (m)	0.2	6.4	2.2
95th Queue (m)	2.6	14.3	8.3
Link Distance (m)	160.1	26.7	251.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 1149

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	193	241	100	469	1650
Future Volume (vph)	193	241	100	469	1650
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.4	12.9	28.9
Total Split (s)	26.6	26.6	8.4	38.4	30.0
Total Split (%)	40.9%	40.9%	12.9%	59.1%	46.2%
Yellow Time (s)	3.3	3.3	3.4	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.4	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	12.9	12.9	43.1	40.6	32.2
Actuated g/C Ratio	0.20	0.20	0.66	0.62	0.50
v/c Ratio	0.57	0.54	0.34	0.22	1.02
Control Delay	29.2	11.1	15.5	1.7	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.1	15.5	1.7	49.8
LOS	C	B	B	A	D
Approach Delay	19.1			4.1	49.8
Approach LOS	B			A	D

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 32 (49%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.02	
Intersection Signal Delay: 35.4	Intersection LOS: D
Intersection Capacity Utilization 79.4%	ICU Level of Service D
Analysis Period (min) 15	

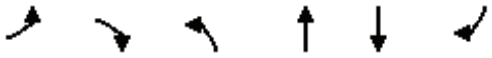
Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	201	251	104	489	1805
v/c Ratio	0.57	0.54	0.34	0.22	1.02
Control Delay	29.2	11.1	15.5	1.7	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.1	15.5	1.7	49.8
Queue Length 50th (m)	22.1	6.3	7.9	1.8	~131.8
Queue Length 95th (m)	35.9	21.3	13.3	10.6	#197.3
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	634	305	2233	1762
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.40	0.34	0.22	1.02

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



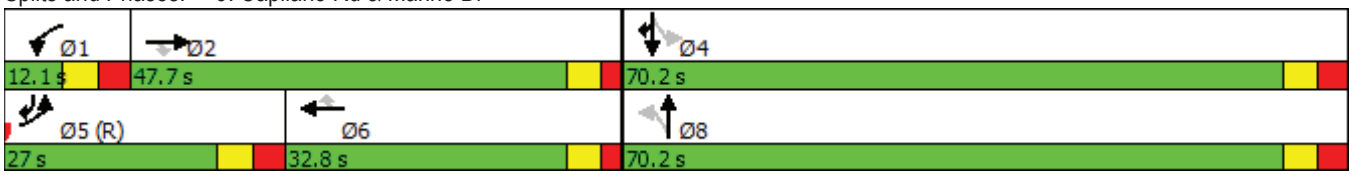
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	193	241	100	469	1650	83
Future Volume (vph)	193	241	100	469	1650	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1789	3579	3547	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1773	1567	215	3579	3547	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	201	251	104	489	1719	86
RTOR Reduction (vph)	0	151	0	0	5	0
Lane Group Flow (vph)	201	100	104	489	1800	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	12.9	12.9	40.6	40.6	31.6	
Effective Green, g (s)	12.9	12.9	40.6	40.6	31.6	
Actuated g/C Ratio	0.20	0.20	0.62	0.62	0.49	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	351	310	269	2235	1724	
v/s Ratio Prot			c0.03	0.14	c0.51	
v/s Ratio Perm	c0.11	0.06	0.21			
v/c Ratio	0.57	0.32	0.39	0.22	1.04	
Uniform Delay, d1	23.6	22.3	12.7	5.3	16.7	
Progression Factor	1.00	1.00	2.68	0.25	1.00	
Incremental Delay, d2	2.3	0.6	0.9	0.2	34.3	
Delay (s)	25.9	22.9	34.9	1.6	51.0	
Level of Service	C	C	C	A	D	
Approach Delay (s)	24.3			7.4	51.0	
Approach LOS	C			A	D	

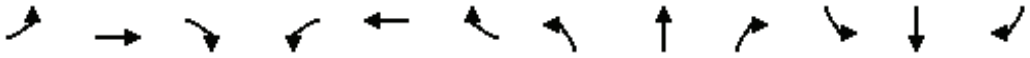
Intersection Summary			
HCM 2000 Control Delay	37.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	426	677	117	18	907	104	25	76	30	147	60	1786
Future Volume (vph)	426	677	117	18	907	104	25	76	30	147	60	1786
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	30.5	30.5	41.4	41.4		13.4	13.4	
Total Split (s)	27.0	47.7	47.7	12.1	32.8	32.8	70.2	70.2		70.2	70.2	
Total Split (%)	20.8%	36.7%	36.7%	9.3%	25.2%	25.2%	54.0%	54.0%		54.0%	54.0%	
Yellow Time (s)	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	5.5	5.5	6.4	5.5	5.5	6.4	6.4		6.4	6.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		Max	Max	
Act Effct Green (s)	20.6	49.2	49.2	5.5	27.0	27.0	64.1	64.1	130.0	64.1	64.1	91.1
Actuated g/C Ratio	0.16	0.38	0.38	0.04	0.21	0.21	0.49	0.49	1.00	0.49	0.49	0.70
v/c Ratio	0.69	0.51	0.18	0.25	0.91	0.29	0.04	0.08	0.02	0.25	0.07	0.92
Control Delay	58.3	33.7	6.0	68.9	64.2	5.0	17.5	17.9	0.0	22.5	18.5	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.8
Total Delay	58.3	33.7	6.0	68.9	64.2	5.0	17.5	17.9	0.0	22.5	18.5	79.8
LOS	E	C	A	E	E	A	B	B	A	C	B	E
Approach Delay		39.7			58.3			13.7			73.7	
Approach LOS		D			E			B			E	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 58.8	Intersection LOS: E
Intersection Capacity Utilization 104.3%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	435	691	119	18	926	106	26	78	31	150	61	1822
v/c Ratio	0.69	0.51	0.18	0.25	0.91	0.29	0.04	0.08	0.02	0.25	0.07	0.92
Control Delay	58.3	33.7	6.0	68.9	64.2	5.0	17.5	17.9	0.0	22.5	18.5	34.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.8
Total Delay	58.3	33.7	6.0	68.9	64.2	5.0	17.5	17.9	0.0	22.5	18.5	79.8
Queue Length 50th (m)	53.4	66.3	0.0	4.6	85.4	0.0	3.4	10.4	0.0	28.2	9.6	238.0
Queue Length 95th (m)	70.3	97.7	13.3	12.9	#108.6	8.4	8.4	19.1	0.0	m38.5	m12.3	268.0
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	626	1353	649	74	1025	374	665	928	1535	590	928	1980
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	482
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.51	0.18	0.24	0.90	0.28	0.04	0.08	0.02	0.25	0.07	1.22

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	426	677	117	18	907	104	25	76	30	147	60	1786
Future Volume (vph)	426	677	117	18	907	104	25	76	30	147	60	1786
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.4	5.5	5.5	6.4	5.5	5.5	6.4	6.4	4.0	6.4	6.4	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1610	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.72	1.00	1.00	0.71	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1351	1883	1535	1197	1883	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	435	691	119	18	926	106	26	78	31	150	61	1822
RTOR Reduction (vph)	0	0	78	0	0	81	0	0	0	0	0	7
Lane Group Flow (vph)	435	691	41	18	926	25	26	78	31	150	61	1815
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	16.7	45.3	45.3	2.3	30.9	30.9	64.1	64.1	130.0	64.1	64.1	87.2
Effective Green, g (s)	16.7	45.3	45.3	2.3	30.9	30.9	64.1	64.1	130.0	64.1	64.1	87.2
Actuated g/C Ratio	0.13	0.35	0.35	0.02	0.24	0.24	0.49	0.49	1.00	0.49	0.49	0.67
Clearance Time (s)	6.4	5.5	5.5	6.4	5.5	5.5	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	508	1247	529	30	1161	301	666	928	1535	590	928	1890
v/s Ratio Prot	0.11	0.19		0.01	c0.19			0.04			0.03	c0.64
v/s Ratio Perm			0.03			0.02	0.02		0.02	0.13		
v/c Ratio	0.86	0.55	0.08	0.60	0.80	0.08	0.04	0.08	0.02	0.25	0.07	0.96
Uniform Delay, d1	55.5	34.2	28.4	63.4	46.6	38.5	17.0	17.4	0.0	19.1	17.3	19.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.11	1.05	1.66
Incremental Delay, d2	16.8	0.5	0.1	24.1	3.9	0.1	0.0	0.0	0.0	0.7	0.1	10.3
Delay (s)	72.2	34.7	28.4	87.5	50.5	38.7	17.1	17.5	0.0	21.9	18.1	43.2
Level of Service	E	C	C	F	D	D	B	B	A	C	B	D
Approach Delay (s)		47.2			49.9			13.4			40.8	
Approach LOS		D			D			B			D	

Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.97		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	104.3%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	55	201	71	536	1792
Future Volume (vph)	55	201	71	536	1792
Turn Type	Perm	Perm	Perm	NA	NA
Protected Phases				8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	8	8	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	12.0	12.0	19.0
Total Split (s)	27.0	27.0	103.0	103.0	103.0
Total Split (%)	20.8%	20.8%	79.2%	79.2%	79.2%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	Min	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	18.6	18.6	100.7	100.7	100.7
Actuated g/C Ratio	0.14	0.14	0.77	0.77	0.77
v/c Ratio	0.23	0.84	0.63	0.20	0.69
Control Delay	50.6	71.9	40.6	1.3	12.5
Queue Delay	0.0	0.6	0.0	0.4	2.1
Total Delay	50.6	72.5	40.6	1.7	14.6
LOS	D	E	D	A	B
Approach Delay	67.8			6.2	14.6
Approach LOS	E			A	B

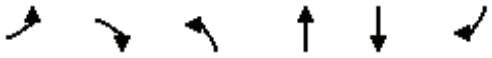
Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 4:SBT and 8:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 17.8	Intersection LOS: B
Intersection Capacity Utilization 78.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	57	207	73	553	1899
v/c Ratio	0.23	0.84	0.63	0.20	0.69
Control Delay	50.6	71.9	40.6	1.3	12.5
Queue Delay	0.0	0.6	0.0	0.4	2.1
Total Delay	50.6	72.5	40.6	1.7	14.6
Queue Length 50th (m)	12.8	42.5	10.8	5.0	135.8
Queue Length 95th (m)	25.5	#77.1	m22.1	5.5	m134.6
Internal Link Dist (m)	40.4			101.6	45.2
Turn Bay Length (m)	30.0		20.0		
Base Capacity (vph)	278	276	115	2771	2751
Starvation Cap Reductn	0	0	0	1669	622
Spillback Cap Reductn	0	6	0	0	673
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.21	0.77	0.63	0.50	0.91

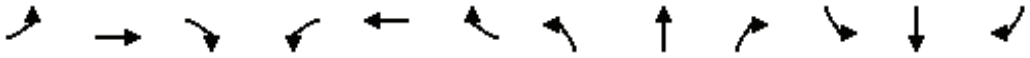
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	55	201	71	536	1792	50
Future Volume (vph)	55	201	71	536	1792	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	5.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.94	1.00	1.00	1.00	
Flpb, ped/bikes	0.95	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1697	1501	1789	3579	3551	
Flt Permitted	0.95	1.00	0.08	1.00	1.00	
Satd. Flow (perm)	1697	1501	149	3579	3551	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	207	73	553	1847	52
RTOR Reduction (vph)	0	32	0	0	1	0
Lane Group Flow (vph)	57	175	73	553	1898	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	Perm	NA	NA	
Protected Phases				8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	18.6	18.6	100.7	100.7	100.7	
Effective Green, g (s)	18.6	18.6	100.7	100.7	100.7	
Actuated g/C Ratio	0.14	0.14	0.77	0.77	0.77	
Clearance Time (s)	5.7	5.7	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	214	115	2772	2750	
v/s Ratio Prot				0.15	c0.53	
v/s Ratio Perm	0.03	c0.12	0.49			
v/c Ratio	0.24	0.82	0.63	0.20	0.69	
Uniform Delay, d1	49.4	54.1	6.5	3.9	7.1	
Progression Factor	1.00	1.00	1.68	0.27	1.56	
Incremental Delay, d2	0.5	21.1	20.6	0.1	0.5	
Delay (s)	49.9	75.1	31.5	1.2	11.6	
Level of Service	D	E	C	A	B	
Approach Delay (s)	69.7			4.7	11.6	
Approach LOS	E			A	B	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	78.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	14	0	9	17	3	0	1	39	13	1	0
Future Volume (Veh/h)	0	14	0	9	17	3	0	1	39	13	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	15	0	9	18	3	0	1	41	14	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	21			15			53	54	15	94	52	20
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	21			15			53	54	15	94	52	20
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	98	100	100
cM capacity (veh/h)	1595			1603			941	833	1065	851	834	1058

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	30	42	15
Volume Left	0	9	0	14
Volume Right	0	3	41	0
cSH	1595	1603	1058	850
Volume to Capacity	0.00	0.01	0.04	0.02
Queue Length 95th (m)	0.0	0.1	0.9	0.4
Control Delay (s)	0.0	2.2	8.5	9.3
Lane LOS		A	A	A
Approach Delay (s)	0.0	2.2	8.5	9.3
Approach LOS			A	A

Intersection Summary				
Average Delay	5.5			
Intersection Capacity Utilization	22.3%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	49.1	37.5	47.7	19.9	26.7	304.2	305.6
Average Queue (m)	31.6	28.9	19.2	7.3	12.4	296.0	295.8
95th Queue (m)	51.6	42.5	40.8	17.9	23.6	301.4	302.0
Link Distance (m)	41.7			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	5	0				76	94
Queuing Penalty (veh)	22	0				0	0
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	8	8	0				
Queuing Penalty (veh)	19	15	1				

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	165.9	161.5	140.5	110.2	67.4	65.9	76.6	94.6	92.8	44.0	64.8	64.4
Average Queue (m)	107.0	102.1	57.7	54.8	10.9	7.1	64.8	83.9	80.2	33.3	35.3	29.2
95th Queue (m)	213.0	211.8	120.4	109.1	42.6	30.9	75.1	99.1	102.8	57.9	76.6	70.4
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		56.1	56.1
Upstream Blk Time (%)	14	11	0			0	6	36	39		11	10
Queuing Penalty (veh)	42	35	1			0	20	124	133		56	50
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				4	0	0	7		53	8		
Queuing Penalty (veh)				4	0	0	1		55	23		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	21.4	52.4	8.5	54.0	58.4	100.9	102.9
Average Queue (m)	6.9	14.6	1.5	21.0	8.2	78.4	79.7
95th Queue (m)	17.7	46.7	14.2	41.5	28.0	103.4	104.7
Link Distance (m)	109.4	109.4			92.4	92.4	92.4
Upstream Blk Time (%)		1			0	1	1
Queuing Penalty (veh)		0			0	4	6
Storage Bay Dist (m)			35.0	70.0			
Storage Blk Time (%)		5	0	0			
Queuing Penalty (veh)		1	0	0			

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	34.8	40.3	31.8	96.6	102.8	61.1	78.4	2.8	34.8
Average Queue (m)	11.8	19.8	26.9	55.5	23.5	18.4	66.0	0.3	23.2
95th Queue (m)	26.7	33.7	38.3	118.6	82.3	52.4	91.2	3.6	44.9
Link Distance (m)		37.9		92.4	92.4	50.8	50.8	12.5	12.5
Upstream Blk Time (%)	0	1		21	1	2	16	0	14
Queuing Penalty (veh)	0	2		63	4	16	150	1	130
Storage Bay Dist (m)	30.0		20.0						
Storage Blk Time (%)	2	3	71	2					
Queuing Penalty (veh)	3	1	191	2					

Intersection: 99: Curling Rd

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	1.8	13.0	9.4
Average Queue (m)	0.1	6.2	3.1
95th Queue (m)	1.3	13.6	9.6
Link Distance (m)	160.1	39.8	251.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 1176

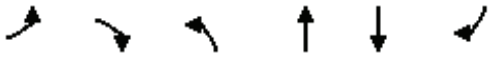
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	103	143	300	1194	737
Future Volume (vph)	103	143	300	1194	737
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.3	12.9	28.9
Total Split (s)	26.6	26.6	9.0	38.4	29.4
Total Split (%)	40.9%	40.9%	13.8%	59.1%	45.2%
Yellow Time (s)	3.3	3.3	3.3	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.3	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	9.7	9.7	46.4	43.8	26.0
Actuated g/C Ratio	0.15	0.15	0.71	0.67	0.40
v/c Ratio	0.41	0.42	0.55	0.52	0.65
Control Delay	29.1	8.5	14.7	9.4	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	8.5	14.7	9.4	18.1
LOS	C	A	B	A	B
Approach Delay	17.1			10.5	18.1
Approach LOS	B			B	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 11 (17%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization 63.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	108	151	316	1257	913
v/c Ratio	0.41	0.42	0.55	0.52	0.65
Control Delay	29.1	8.5	14.7	9.4	18.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.1	8.5	14.7	9.4	18.1
Queue Length 50th (m)	12.0	0.0	42.1	90.6	41.7
Queue Length 95th (m)	23.4	12.6	56.5	85.0	65.9
Internal Link Dist (m)	38.4			71.2	275.3
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	572	608	573	2412	1413
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.25	0.55	0.52	0.65

Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	103	143	300	1194	737	130
Future Volume (vph)	103	143	300	1194	737	130
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.3	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1773	1567	1788	3579	3480	
Flt Permitted	0.95	1.00	0.19	1.00	1.00	
Satd. Flow (perm)	1773	1567	355	3579	3480	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	108	151	316	1257	776	137
RTOR Reduction (vph)	0	128	0	0	21	0
Lane Group Flow (vph)	108	23	316	1257	892	0
Confl. Peds. (#/hr)	10	10	10			10
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	9.7	9.7	43.8	43.8	26.0	
Effective Green, g (s)	9.7	9.7	43.8	43.8	26.0	
Actuated g/C Ratio	0.15	0.15	0.67	0.67	0.40	
Clearance Time (s)	5.6	5.6	3.3	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	264	233	558	2411	1392	
v/s Ratio Prot			c0.13	0.35	c0.26	
v/s Ratio Perm	c0.06	0.01	0.25			
v/c Ratio	0.41	0.10	0.57	0.52	0.64	
Uniform Delay, d1	25.1	23.9	6.4	5.3	15.7	
Progression Factor	1.00	1.00	2.46	1.55	1.00	
Incremental Delay, d2	1.1	0.2	1.1	0.7	2.3	
Delay (s)	26.2	24.1	16.9	8.9	18.0	
Level of Service	C	C	B	A	B	
Approach Delay (s)	24.9			10.5	18.0	
Approach LOS	C			B	B	

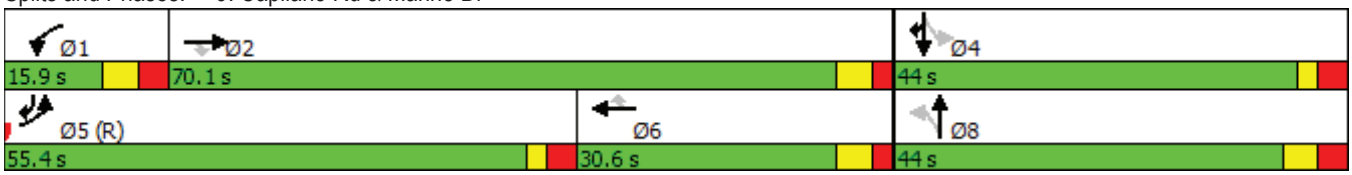
Intersection Summary			
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		

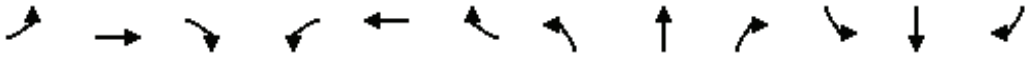
c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1188	1043	227	45	664	223	165	266	28	171	120	589
Future Volume (vph)	1188	1043	227	45	664	223	165	266	28	171	120	589
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.9	26.5	26.5	11.4	30.5	30.5	41.4	41.4		35.4	35.4	
Total Split (s)	55.4	70.1	70.1	15.9	30.6	30.6	44.0	44.0		44.0	44.0	
Total Split (%)	42.6%	53.9%	53.9%	12.2%	23.5%	23.5%	33.8%	33.8%		33.8%	33.8%	
Yellow Time (s)	2.0	3.4	3.4	3.4	3.4	3.4	3.4	3.4		2.0	2.0	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	1.4	
Total Lost Time (s)	6.9	5.5	5.5	6.4	5.5	5.5	6.4	6.4		5.0	6.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Max	Min	Min	None	Min	Min	None	None		None	None	
Act Effct Green (s)	51.9	71.1	71.1	8.0	24.4	24.4	34.9	34.9	130.0	36.3	34.9	95.1
Actuated g/C Ratio	0.40	0.55	0.55	0.06	0.19	0.19	0.27	0.27	1.00	0.28	0.27	0.73
v/c Ratio	0.83	0.59	0.27	0.47	0.80	0.72	0.55	0.58	0.02	0.98	0.26	0.31
Control Delay	41.4	22.8	5.0	73.3	57.7	37.1	47.1	45.6	0.0	94.5	28.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	41.4	22.8	5.0	73.3	57.7	37.1	47.1	45.6	0.0	94.5	28.8	3.8
LOS	D	C	A	E	E	D	D	D	A	F	C	A
Approach Delay		30.1			53.5			43.3			24.9	
Approach LOS		C			D			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.98	
Intersection Signal Delay: 35.0	Intersection LOS: D
Intersection Capacity Utilization 108.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1305	1146	249	49	730	245	181	292	31	188	132	647
v/c Ratio	0.83	0.59	0.27	0.47	0.80	0.72	0.55	0.58	0.02	0.98	0.26	0.31
Control Delay	41.4	22.8	5.0	73.3	57.7	37.1	47.1	45.6	0.0	94.5	28.8	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Total Delay	41.4	22.8	5.0	73.3	57.7	37.1	47.1	45.6	0.0	94.5	28.8	3.8
Queue Length 50th (m)	155.3	109.5	6.0	12.3	65.6	29.4	38.8	63.0	0.0	47.1	19.5	9.0
Queue Length 95th (m)	183.7	134.0	20.3	25.4	80.7	60.2	62.3	91.5	0.0	#93.2	31.9	19.6
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	1578	1957	922	124	943	345	354	544	1535	206	544	2054
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	776
Spillback Cap Reductn	1	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.59	0.27	0.40	0.77	0.71	0.51	0.54	0.02	0.91	0.24	0.51

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1188	1043	227	45	664	223	165	266	28	171	120	589
Future Volume (vph)	1188	1043	227	45	664	223	165	266	28	171	120	589
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.9	5.5	5.5	6.4	5.5	5.5	6.4	6.4	4.0	5.0	6.4	5.0
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1679	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.65	1.00	1.00	0.39	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1226	1883	1535	687	1883	2818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1305	1146	249	49	730	245	181	292	31	188	132	647
RTOR Reduction (vph)	0	0	94	0	0	99	0	0	0	0	0	6
Lane Group Flow (vph)	1305	1146	155	49	730	146	181	292	31	188	132	641
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	52.5	69.8	69.8	7.0	25.7	25.7	34.9	34.9	130.0	36.3	36.3	93.8
Effective Green, g (s)	50.6	69.8	69.8	7.0	25.7	25.7	34.9	34.9	130.0	36.3	34.9	93.8
Actuated g/C Ratio	0.39	0.54	0.54	0.05	0.20	0.20	0.27	0.27	1.00	0.28	0.27	0.72
Clearance Time (s)	5.0	5.5	5.5	6.4	5.5	5.5	6.4	6.4		5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1539	1921	816	91	965	251	329	505	1535	191	505	2033
v/s Ratio Prot	c0.33	0.32		0.03	c0.15			0.16			0.07	0.23
v/s Ratio Perm			0.10			0.11	0.15		0.02	c0.27		
v/c Ratio	0.85	0.60	0.19	0.54	0.76	0.58	0.55	0.58	0.02	0.98	0.26	0.32
Uniform Delay, d1	36.2	20.5	15.5	59.9	49.2	47.3	40.8	41.2	0.0	46.6	37.4	6.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.77	0.75	0.52
Incremental Delay, d2	6.0	0.5	0.1	4.7	3.4	3.2	2.0	1.6	0.0	57.7	0.3	0.1
Delay (s)	42.2	21.0	15.6	64.6	52.6	50.5	42.8	42.8	0.0	93.5	28.4	3.5
Level of Service	D	C	B	E	D	D	D	D	A	F	C	A
Approach Delay (s)		30.8			52.7			40.2			24.4	
Approach LOS		C			D			D			C	

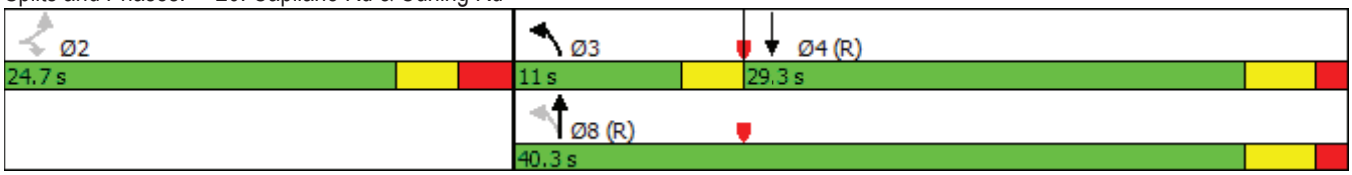
Intersection Summary			
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.8
Intersection Capacity Utilization	108.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	61	102	195	1484	766
Future Volume (vph)	61	102	195	1484	766
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			3	8	4
Permitted Phases	2	2	8		
Detector Phase	2	2	3	8	4
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	7.0	7.0
Minimum Split (s)	24.7	24.7	8.0	12.0	19.0
Total Split (s)	24.7	24.7	11.0	40.3	29.3
Total Split (%)	38.0%	38.0%	16.9%	62.0%	45.1%
Yellow Time (s)	3.0	3.0	3.0	3.4	3.4
All-Red Time (s)	2.7	2.7	0.0	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	3.0	5.0	5.0
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	Min	Min	None	C-Max	C-Max
Act Effct Green (s)	7.8	7.8	48.5	46.5	36.0
Actuated g/C Ratio	0.12	0.12	0.75	0.72	0.55
v/c Ratio	0.30	0.38	0.42	0.61	0.48
Control Delay	29.2	10.3	5.3	3.6	2.4
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	29.2	10.3	5.3	3.8	2.4
LOS	C	B	A	A	A
Approach Delay	17.4			4.0	2.4
Approach LOS	B			A	A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 25 (38%), Referenced to phase 4:SBT and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 4.3	Intersection LOS: A
Intersection Capacity Utilization 60.7%	ICU Level of Service B
Analysis Period (min) 15	

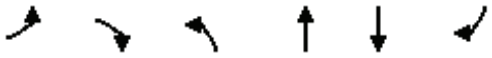
Splits and Phases: 20: Capilano Rd & Curling Rd



Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	64	107	205	1562	920
v/c Ratio	0.30	0.38	0.42	0.61	0.48
Control Delay	29.2	10.3	5.3	3.6	2.4
Queue Delay	0.0	0.0	0.0	0.2	0.0
Total Delay	29.2	10.3	5.3	3.8	2.4
Queue Length 50th (m)	7.2	0.0	2.3	13.2	4.1
Queue Length 95th (m)	16.3	11.4	m12.5	42.2	9.8
Internal Link Dist (m)	40.4			101.6	45.2
Turn Bay Length (m)	30.0		20.0		
Base Capacity (vph)	509	526	510	2558	1936
Starvation Cap Reductn	0	0	0	327	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.13	0.20	0.40	0.70	0.48

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	61	102	195	1484	766	108
Future Volume (vph)	61	102	195	1484	766	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7	3.0	5.0	5.0	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.96	1.00	1.00	0.99	
Flpb, ped/bikes	0.97	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1743	1541	1785	3579	3479	
Flt Permitted	0.95	1.00	0.24	1.00	1.00	
Satd. Flow (perm)	1743	1541	453	3579	3479	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	64	107	205	1562	806	114
RTOR Reduction (vph)	0	94	0	0	12	0
Lane Group Flow (vph)	64	13	205	1562	908	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			3	8	4	
Permitted Phases	2	2	8			
Actuated Green, G (s)	7.8	7.8	46.5	46.5	36.0	
Effective Green, g (s)	7.8	7.8	46.5	46.5	36.0	
Actuated g/C Ratio	0.12	0.12	0.72	0.72	0.55	
Clearance Time (s)	5.7	5.7	3.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	2.5	3.0	3.0	
Lane Grp Cap (vph)	209	184	477	2560	1926	
v/s Ratio Prot			0.05	c0.44	0.26	
v/s Ratio Perm	c0.04	0.01	0.26			
v/c Ratio	0.31	0.07	0.43	0.61	0.47	
Uniform Delay, d1	26.1	25.4	3.9	4.7	8.8	
Progression Factor	1.00	1.00	1.39	0.58	0.18	
Incremental Delay, d2	0.8	0.2	0.3	0.7	0.7	
Delay (s)	27.0	25.5	5.7	3.4	2.3	
Level of Service	C	C	A	A	A	
Approach Delay (s)	26.1			3.6	2.3	
Approach LOS	C			A	A	

Intersection Summary			
HCM 2000 Control Delay	4.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	60.7%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	28	0	32	89	12	0	1	20	9	4	0
Future Volume (Veh/h)	0	28	0	32	89	12	0	1	20	9	4	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	29	0	34	94	13	0	1	21	9	4	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	107			29			200	204	29	219	198	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	107			29			200	204	29	219	198	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			100	100	98	99	99	100
cM capacity (veh/h)	1484			1584			743	678	1046	710	683	955

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	141	22	13
Volume Left	0	34	0	9
Volume Right	0	13	21	0
cSH	1484	1584	1021	701
Volume to Capacity	0.00	0.02	0.02	0.02
Queue Length 95th (m)	0.0	0.5	0.5	0.4
Control Delay (s)	0.0	1.9	8.6	10.2
Lane LOS		A	A	B
Approach Delay (s)	0.0	1.9	8.6	10.2
Approach LOS			A	B

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	27.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	44.4	35.4	57.3	84.5	82.7	185.3	189.3
Average Queue (m)	18.8	18.0	42.3	52.2	54.6	56.3	72.3
95th Queue (m)	36.4	32.3	63.7	83.3	81.8	141.4	153.7
Link Distance (m)	41.7			80.1	80.1	289.2	289.2
Upstream Blk Time (%)	5	0		1	0	2	2
Queuing Penalty (veh)	12	0		5	3	0	0
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	3	5	4	4			
Queuing Penalty (veh)	4	5	25	13			

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	174.3	171.6	138.1	121.8	67.5	50.3	71.3	89.6	94.8	44.0	52.9	57.4
Average Queue (m)	123.9	120.3	60.8	60.6	25.0	12.4	56.5	69.3	70.2	41.0	8.3	9.1
95th Queue (m)	195.2	192.4	93.3	87.9	69.6	33.9	75.3	92.0	99.8	53.3	36.4	37.1
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		56.1	56.1
Upstream Blk Time (%)	2	1	0	0		0	2	12	22		0	1
Queuing Penalty (veh)	13	8	0	0		0	5	36	69		2	3
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				6	0	0	2		29	26		
Queuing Penalty (veh)				14	0	0	1		66	56		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	108.4	108.3	34.0	81.9	106.4	85.9	84.1
Average Queue (m)	78.2	66.1	6.9	65.6	65.2	23.9	22.2
95th Queue (m)	134.6	123.3	32.4	101.9	134.1	72.3	64.5
Link Distance (m)	109.4	109.4			92.4	92.4	92.4
Upstream Blk Time (%)	32	12			32	3	1
Queuing Penalty (veh)	0	0			93	8	3
Storage Bay Dist (m)			35.0	70.0			
Storage Blk Time (%)		31	0	49	5		
Queuing Penalty (veh)		9	0	59	9		

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	NB	NB	NB	SB	SB	B28	B28
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	21.2	21.8	31.8	84.8	78.1	66.5	78.7	25.2	32.1
Average Queue (m)	8.6	9.9	27.0	48.5	45.6	37.2	42.5	8.6	6.2
95th Queue (m)	18.2	18.2	37.4	78.8	70.6	85.7	80.4	28.9	25.1
Link Distance (m)		37.9		92.4	92.4	50.8	50.8	12.5	12.5
Upstream Blk Time (%)				0	0	32	17	23	7
Queuing Penalty (veh)				1	0	138	73	98	29
Storage Bay Dist (m)	30.0		20.0						
Storage Blk Time (%)	0	0	19	16					
Queuing Penalty (veh)	0	0	144	31					

Intersection: 99: Curling Rd

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	5.0	9.0	8.3
Average Queue (m)	0.2	4.8	2.1
95th Queue (m)	2.3	12.0	7.9
Link Distance (m)	160.1	33.7	251.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 1036

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	192	239	98	524	1686
Future Volume (vph)	192	239	98	524	1686
Turn Type	Prot	Perm	pm+pt	NA	NA
Protected Phases	4		5	2	6
Permitted Phases		4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.4	12.9	28.9
Total Split (s)	26.6	26.6	8.4	38.4	30.0
Total Split (%)	40.9%	40.9%	12.9%	59.1%	46.2%
Yellow Time (s)	3.3	3.3	3.4	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.4	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	12.8	12.8	43.2	40.7	32.3
Actuated g/C Ratio	0.20	0.20	0.66	0.63	0.50
v/c Ratio	0.57	0.55	0.33	0.24	1.04
Control Delay	29.2	11.3	17.9	1.6	55.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.3	17.9	1.6	55.4
LOS	C	B	B	A	E
Approach Delay	19.3			4.1	55.4
Approach LOS	B			A	E

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 24 (37%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.04	
Intersection Signal Delay: 38.6	Intersection LOS: D
Intersection Capacity Utilization 82.2%	ICU Level of Service E
Analysis Period (min) 15	

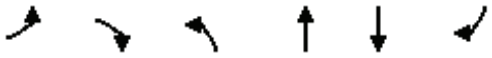
Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	200	249	102	546	1841
v/c Ratio	0.57	0.55	0.33	0.24	1.04
Control Delay	29.2	11.3	17.9	1.6	55.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.2	11.3	17.9	1.6	55.4
Queue Length 50th (m)	22.0	6.2	7.6	3.1	~136.6
Queue Length 95th (m)	35.7	21.1	21.0	4.3	#202.5
Internal Link Dist (m)	38.4			71.2	59.6
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	577	626	306	2239	1765
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.35	0.40	0.33	0.24	1.04

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



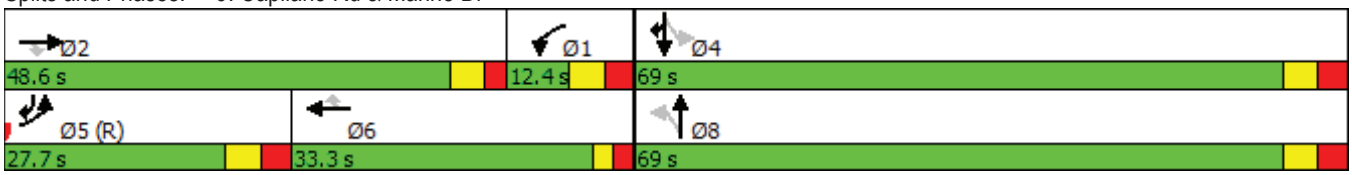
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	192	239	98	524	1686	82
Future Volume (vph)	192	239	98	524	1686	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1789	1545	1789	3579	3545	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1789	1545	215	3579	3545	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	200	249	102	546	1756	85
RTOR Reduction (vph)	0	151	0	0	4	0
Lane Group Flow (vph)	200	98	102	546	1837	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Prot	Perm	pm+pt	NA	NA	
Protected Phases	4		5	2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.8	12.8	40.7	40.7	31.6	
Effective Green, g (s)	12.8	12.8	40.7	40.7	31.6	
Actuated g/C Ratio	0.20	0.20	0.63	0.63	0.49	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	352	304	272	2241	1723	
v/s Ratio Prot	c0.11		c0.03	0.15	c0.52	
v/s Ratio Perm		0.06	0.20			
v/c Ratio	0.57	0.32	0.38	0.24	1.07	
Uniform Delay, d1	23.6	22.4	12.6	5.4	16.7	
Progression Factor	1.00	1.00	3.24	0.22	1.00	
Incremental Delay, d2	2.2	0.7	0.9	0.3	41.7	
Delay (s)	25.8	23.0	41.8	1.5	58.4	
Level of Service	C	C	D	A	E	
Approach Delay (s)	24.3			7.8	58.4	
Approach LOS	C			A	E	

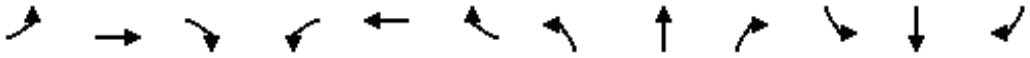
Intersection Summary			
HCM 2000 Control Delay	42.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	82.2%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	761	128	22	933	72	27	87	36	117	65	1802
Future Volume (vph)	476	761	128	22	933	72	27	87	36	117	65	1802
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	29.1	29.1	41.4	41.4		13.4	13.4	
Total Split (s)	27.7	48.6	48.6	12.4	33.3	33.3	69.0	69.0		69.0	69.0	
Total Split (%)	21.3%	37.4%	37.4%	9.5%	25.6%	25.6%	53.1%	53.1%		53.1%	53.1%	
Yellow Time (s)	3.4	3.4	3.4	3.4	2.0	2.0	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		Max	Max	
Act Effct Green (s)	21.3	44.6	44.6	8.6	28.6	28.6	63.2	63.2	130.0	63.2	63.2	90.9
Actuated g/C Ratio	0.16	0.34	0.34	0.07	0.22	0.22	0.49	0.49	1.00	0.49	0.49	0.70
v/c Ratio	0.75	0.63	0.22	0.20	0.89	0.21	0.04	0.10	0.02	0.21	0.07	0.92
Control Delay	59.9	39.8	8.2	51.0	51.4	4.2	18.2	18.7	0.0	21.0	19.5	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	39.8	8.2	51.0	51.4	4.2	18.2	18.7	0.0	21.0	19.5	17.8
LOS	E	D	A	D	D	A	B	B	A	C	B	B
Approach Delay		43.9			48.1			14.1			18.0	
Approach LOS		D			D			B			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.92	
Intersection Signal Delay: 32.5	Intersection LOS: C
Intersection Capacity Utilization 103.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	486	777	131	22	952	73	28	89	37	119	66	1839
v/c Ratio	0.75	0.63	0.22	0.20	0.89	0.21	0.04	0.10	0.02	0.21	0.07	0.92
Control Delay	59.9	39.8	8.2	51.0	51.4	4.2	18.2	18.7	0.0	21.0	19.5	17.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.9	39.8	8.2	51.0	51.4	4.2	18.2	18.7	0.0	21.0	19.5	17.8
Queue Length 50th (m)	60.1	97.8	2.5	5.3	87.4	0.3	3.7	12.1	0.0	16.3	8.0	96.1
Queue Length 95th (m)	78.0	112.2	16.4	12.7	#88.4	4.1	9.2	21.8	0.0	m27.5	m14.6	#109.7
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	648	1306	629	115	1097	348	653	915	1535	576	915	1993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.59	0.21	0.19	0.87	0.21	0.04	0.10	0.02	0.21	0.07	0.92

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	476	761	128	22	933	72	27	87	36	117	65	1802
Future Volume (vph)	476	761	128	22	933	72	27	87	36	117	65	1802
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4	4.0	6.4	6.4	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1613	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.71	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1345	1883	1535	1187	1883	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	486	777	131	22	952	73	28	89	37	119	66	1839
RTOR Reduction (vph)	0	0	80	0	0	56	0	0	0	0	0	24
Lane Group Flow (vph)	486	777	51	22	952	17	28	89	37	119	66	1815
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	18.8	42.1	42.1	6.4	31.1	31.1	63.2	63.2	130.0	63.2	63.2	88.4
Effective Green, g (s)	18.8	42.1	42.1	6.4	31.1	31.1	63.2	63.2	130.0	63.2	63.2	88.4
Actuated g/C Ratio	0.14	0.32	0.32	0.05	0.24	0.24	0.49	0.49	1.00	0.49	0.49	0.68
Clearance Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	571	1159	492	83	1168	303	653	915	1535	577	915	1916
v/s Ratio Prot	0.12	0.22		0.01	c0.19			0.05			0.04	c0.64
v/s Ratio Perm			0.03			0.01	0.02		0.02	0.10		
v/c Ratio	0.85	0.67	0.10	0.27	0.82	0.06	0.04	0.10	0.02	0.21	0.07	0.95
Uniform Delay, d1	54.2	38.0	30.8	59.5	46.7	38.1	17.5	18.0	0.0	19.1	17.8	18.7
Progression Factor	1.00	1.00	1.00	0.82	0.83	0.40	1.00	1.00	1.00	1.04	1.06	0.65
Incremental Delay, d2	14.8	1.5	0.1	1.2	4.3	0.1	0.0	0.0	0.0	0.6	0.1	8.9
Delay (s)	69.0	39.5	30.8	50.3	43.1	15.2	17.6	18.1	0.0	20.4	19.0	20.9
Level of Service	E	D	C	D	D	B	B	B	A	C	B	C
Approach Delay (s)		49.0			41.3			13.6			20.8	
Approach LOS		D			D			B			C	

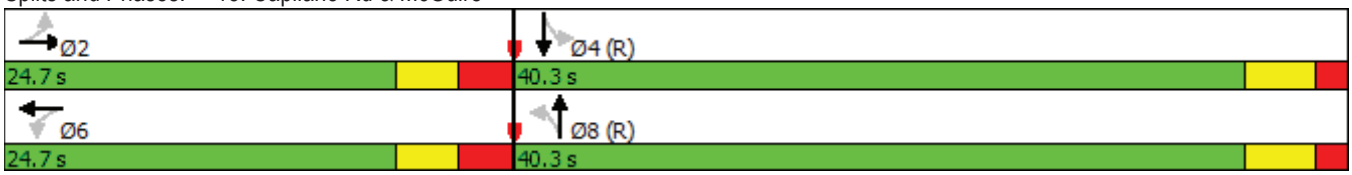
Intersection Summary			
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	103.7%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	0	1	618	20	1902
Future Volume (vph)	0	1	618	20	1902
Turn Type	NA	NA	NA	Perm	NA
Protected Phases	2	6	8		4
Permitted Phases				4	
Detector Phase	2	6	8	4	4
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	19.0	19.0	19.0
Total Split (s)	24.7	24.7	40.3	40.3	40.3
Total Split (%)	38.0%	38.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	7.0	7.0	61.5	61.5	61.5
Actuated g/C Ratio	0.11	0.11	0.95	0.95	0.95
v/c Ratio	0.01	0.06	0.19	0.03	0.58
Control Delay	0.0	17.0	0.5	0.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	17.0	0.5	0.5	4.1
LOS	A	B	A	A	A
Approach Delay	0.0	17.0	0.5		4.1
Approach LOS	A	B	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 26 (40%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Capilano Rd & McGuire



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1	10	655	21	1961
v/c Ratio	0.01	0.06	0.19	0.03	0.58
Control Delay	0.0	17.0	0.5	0.5	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	17.0	0.5	0.5	4.1
Queue Length 50th (m)	0.0	0.1	0.0	0.0	7.3
Queue Length 95th (m)	0.0	3.9	11.6	m0.2	m29.3
Internal Link Dist (m)	40.6	108.8	75.7		71.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	474	466	3364	702	3384
Starvation Cap Reductn	0	0	311	0	127
Spillback Cap Reductn	0	0	0	0	120
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.02	0.21	0.03	0.60

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

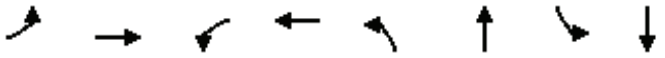
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	0	1	9	0	618	17	20	1902	0
Future Volume (vph)	0	0	1	0	1	9	0	618	17	20	1902	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7			5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frpb, ped/bikes		0.96			0.97			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.98	1.00	
Frt		0.85			0.86			1.00		1.00	1.00	
Flt Protected		1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1541			1575			3556		1747	3579	
Flt Permitted		1.00			1.00			1.00		0.40	1.00	
Satd. Flow (perm)		1541			1575			3556		741	3579	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	1	0	1	9	0	637	18	21	1961	0
RTOR Reduction (vph)	0	1	0	0	9	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1	0	0	654	0	21	1961	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		1.4			1.4			52.9		52.9	52.9	
Effective Green, g (s)		1.4			1.4			52.9		52.9	52.9	
Actuated g/C Ratio		0.02			0.02			0.81		0.81	0.81	
Clearance Time (s)		5.7			5.7			5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		33			33			2894		603	2912	
v/s Ratio Prot		0.00			c0.00			0.18			c0.55	
v/s Ratio Perm										0.03		
v/c Ratio		0.00			0.04			0.23		0.03	0.67	
Uniform Delay, d1		31.1			31.1			1.4		1.2	2.5	
Progression Factor		1.00			1.00			0.48		0.37	2.21	
Incremental Delay, d2		0.0			0.4			0.2		0.0	0.4	
Delay (s)		31.1			31.6			0.8		0.5	5.9	
Level of Service		C			C			A		A	A	
Approach Delay (s)		31.1			31.6			0.8			5.8	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	52	50	29	23	52	572	36	1821
Future Volume (vph)	52	50	29	23	52	572	36	1821
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	24.7	24.7	19.0	19.0	19.0	19.0
Total Split (s)	27.0	27.0	27.0	27.0	103.0	103.0	103.0	103.0
Total Split (%)	20.8%	20.8%	20.8%	20.8%	79.2%	79.2%	79.2%	79.2%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.4	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	2.7	2.7	1.6	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	17.3	17.3	17.3	17.3	102.0	102.0	102.0	102.0
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.78	0.78	0.78	0.78
v/c Ratio	0.31	0.79	0.35	0.20	0.48	0.22	0.06	0.69
Control Delay	54.4	66.2	62.0	29.2	34.2	1.6	5.1	8.1
Queue Delay	0.0	0.7	0.2	0.0	0.0	0.2	0.0	0.2
Total Delay	54.4	66.9	62.2	29.2	34.2	1.8	5.1	8.2
LOS	D	E	E	C	C	A	A	A
Approach Delay		64.1		41.6		4.5		8.2
Approach LOS		E		D		A		A

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 84 (65%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 12.9	Intersection LOS: B
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd



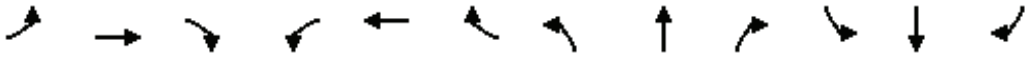
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	54	191	30	50	54	606	37	1930
v/c Ratio	0.31	0.79	0.35	0.20	0.48	0.22	0.06	0.69
Control Delay	54.4	66.2	62.0	29.2	34.2	1.6	5.1	8.1
Queue Delay	0.0	0.7	0.2	0.0	0.0	0.2	0.0	0.2
Total Delay	54.4	66.9	62.2	29.2	34.2	1.8	5.1	8.2
Queue Length 50th (m)	12.6	39.1	6.9	5.4	6.9	8.5	2.1	59.8
Queue Length 95th (m)	25.0	63.8	16.5	16.2	m11.6	12.6	m3.4	123.0
Internal Link Dist (m)		40.4		47.6		101.6		75.7
Turn Bay Length (m)	30.0		30.0		20.0		30.0	
Base Capacity (vph)	212	291	105	297	113	2789	589	2788
Starvation Cap Reductn	0	0	0	0	0	1309	0	179
Spillback Cap Reductn	0	13	5	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.69	0.30	0.17	0.48	0.41	0.06	0.74

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	50	135	29	23	25	52	572	16	36	1821	51
Future Volume (vph)	52	50	135	29	23	25	52	572	16	36	1821	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.95		1.00	0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		0.97	1.00		1.00	1.00		0.95	1.00	
Frt	1.00	0.89		1.00	0.92		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1704	1602		1733	1680		1789	3552		1703	3551	
Flt Permitted	0.72	1.00		0.35	1.00		0.08	1.00		0.42	1.00	
Satd. Flow (perm)	1299	1602		647	1680		146	3552		750	3551	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	54	52	139	30	24	26	54	590	16	37	1877	53
RTOR Reduction (vph)	0	30	0	0	23	0	0	1	0	0	1	0
Lane Group Flow (vph)	54	161	0	30	27	0	54	605	0	37	1929	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	17.3	17.3		17.3	17.3		102.0	102.0		102.0	102.0	
Effective Green, g (s)	17.3	17.3		17.3	17.3		102.0	102.0		102.0	102.0	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.78	0.78		0.78	0.78	
Clearance Time (s)	5.7	5.7		5.7	5.7		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	172	213		86	223		114	2786		588	2786	
v/s Ratio Prot		c0.10			0.02			0.17			c0.54	
v/s Ratio Perm	0.04			0.05			0.37			0.05		
v/c Ratio	0.31	0.75		0.35	0.12		0.47	0.22		0.06	0.69	
Uniform Delay, d1	51.0	54.3		51.2	49.7		4.8	3.6		3.2	6.6	
Progression Factor	1.00	1.00		1.01	1.00		2.55	0.37		1.25	0.94	
Incremental Delay, d2	1.1	14.0		2.4	0.2		11.0	0.1		0.2	1.2	
Delay (s)	52.0	68.3		54.3	49.7		23.3	1.5		4.1	7.4	
Level of Service	D	E		D	D		C	A		A	A	
Approach Delay (s)		64.7			51.4			3.3			7.4	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	14	0	15	17	3	0	1	21	13	1	0
Future Volume (Veh/h)	0	14	0	15	17	3	0	1	21	13	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	15	0	16	18	3	0	1	22	14	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	21			15			67	68	15	89	66	20
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	21			15			67	68	15	89	66	20
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	98	100	100
cM capacity (veh/h)	1595			1603			918	814	1065	870	816	1058

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	37	23	15
Volume Left	0	16	0	14
Volume Right	0	3	22	0
cSH	1595	1603	1051	866
Volume to Capacity	0.00	0.01	0.02	0.02
Queue Length 95th (m)	0.0	0.2	0.5	0.4
Control Delay (s)	0.0	3.2	8.5	9.2
Lane LOS		A	A	A
Approach Delay (s)	0.0	3.2	8.5	9.2
Approach LOS			A	A

Intersection Summary				
Average Delay	5.0			
Intersection Capacity Utilization	22.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB	B13	B13
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	48.4	37.5	40.0	23.0	26.6	94.4	96.8	225.2	221.6
Average Queue (m)	29.5	28.4	16.8	8.5	12.3	80.8	88.7	213.6	213.8
95th Queue (m)	48.3	41.2	31.0	19.9	25.5	101.4	94.0	219.6	219.5
Link Distance (m)	41.7			74.4	74.4	65.2	65.2	207.3	207.3
Upstream Blk Time (%)	3	0				36	86	79	95
Queuing Penalty (veh)	13	0				0	0	0	0
Storage Bay Dist (m)		30.0	50.0						
Storage Blk Time (%)	6	8	0						
Queuing Penalty (veh)	14	16	0						

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	89.1	83.4	118.2	120.1	67.4	65.7	88.0	89.6	94.4	44.0	54.0	53.5
Average Queue (m)	58.4	52.9	60.2	59.9	16.7	11.8	74.4	75.8	85.9	26.8	31.9	34.5
95th Queue (m)	84.0	78.5	95.2	96.0	55.8	44.4	97.8	93.0	99.8	58.3	64.9	62.0
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		27.8	27.8
Upstream Blk Time (%)						0	30	38	52		28	36
Queuing Penalty (veh)						0	102	128	176		139	181
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				9	0	0	32		71	0		
Queuing Penalty (veh)				12	0	0	7		51	0		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	23.4	30.8	8.0	34.1	19.6	77.5	76.5
Average Queue (m)	5.8	12.2	0.0	12.4	5.6	45.0	45.7
95th Queue (m)	16.8	25.7	0.0	26.8	15.4	70.3	69.7
Link Distance (m)	109.4	109.4			91.1	91.1	91.1
Upstream Blk Time (%)							0
Queuing Penalty (veh)							0
Storage Bay Dist (m)			35.0	70.0			
Storage Blk Time (%)		0	0				
Queuing Penalty (veh)		0	0				

Intersection: 15: Capilano Rd & McGuire

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	TR	TR	T	TR	L	T	TR
Maximum Queue (m)	7.3	12.6	21.5	25.9	12.6	89.3	91.7
Average Queue (m)	0.3	2.4	7.9	7.3	2.2	48.2	67.5
95th Queue (m)	3.1	9.2	18.7	19.4	8.9	102.8	102.7
Link Distance (m)	41.5	109.8	78.1	78.1		74.4	74.4
Upstream Blk Time (%)						2	7
Queuing Penalty (veh)						22	71
Storage Bay Dist (m)					15.0		
Storage Blk Time (%)			2		0	4	
Queuing Penalty (veh)			0		0	1	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	37.4	43.0	19.7	29.1	26.8	40.3	34.1	16.0	79.2	90.4
Average Queue (m)	16.1	30.9	6.5	9.7	10.2	11.5	12.8	2.5	13.6	73.9
95th Queue (m)	34.4	48.7	16.4	21.7	24.3	28.6	28.6	10.3	50.2	90.5
Link Distance (m)		38.0		47.8		91.1	91.1		78.1	78.1
Upstream Blk Time (%)	0	14							0	8
Queuing Penalty (veh)	0	34							3	76
Storage Bay Dist (m)	30.0		30.0		20.0			30.0		
Storage Blk Time (%)	1	22	0	0	11	1		0	0	
Queuing Penalty (veh)	2	11	0	0	33	0		0	0	

Intersection: 99: 303 Marine Access/Glenaire Dr & Curling Rd

Movement	NB
Directions Served	LTR
Maximum Queue (m)	12.1
Average Queue (m)	5.1
95th Queue (m)	12.7
Link Distance (m)	60.8
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (m)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Zone Summary

Zone wide Queuing Penalty: 1093

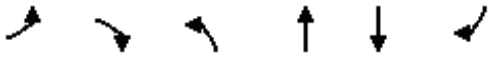
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	104	139	288	1254	834
Future Volume (vph)	104	139	288	1254	834
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.3	12.9	28.9
Total Split (s)	26.6	26.6	9.0	38.4	29.4
Total Split (%)	40.9%	40.9%	13.8%	59.1%	45.2%
Yellow Time (s)	3.3	3.3	3.3	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.3	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	9.8	9.8	48.8	47.4	28.7
Actuated g/C Ratio	0.15	0.15	0.75	0.73	0.44
v/c Ratio	0.42	0.41	0.54	0.51	0.65
Control Delay	29.2	8.5	14.4	8.7	17.9
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	29.2	8.5	14.4	8.8	17.9
LOS	C	A	B	A	B
Approach Delay	17.4			9.8	17.9
Approach LOS	B			A	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 7 (11%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 68.6%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	109	146	303	1320	1007
v/c Ratio	0.42	0.41	0.54	0.51	0.65
Control Delay	29.2	8.5	14.4	8.7	17.9
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	29.2	8.5	14.4	8.8	17.9
Queue Length 50th (m)	12.1	0.0	34.5	95.4	49.0
Queue Length 95th (m)	23.5	12.5	43.8	70.4	75.5
Internal Link Dist (m)	38.4			71.2	62.7
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	564	597	556	2611	1552
Starvation Cap Reductn	0	0	0	354	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.24	0.54	0.58	0.65

Intersection Summary



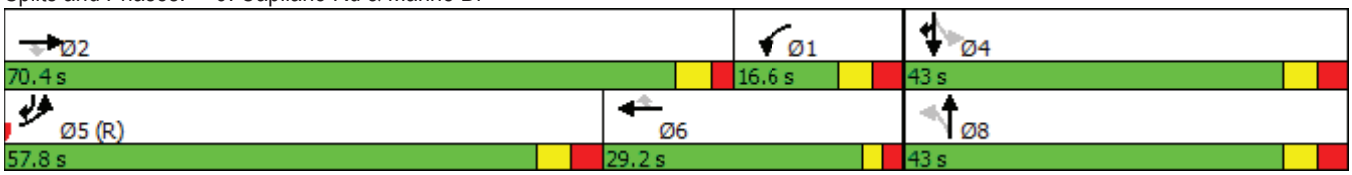
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	139	288	1254	834	123
Future Volume (vph)	104	139	288	1254	834	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.3	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.97	1.00	1.00	0.99	
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1748	1545	1788	3579	3485	
Flt Permitted	0.95	1.00	0.16	1.00	1.00	
Satd. Flow (perm)	1748	1545	309	3579	3485	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	109	146	303	1320	878	129
RTOR Reduction (vph)	0	127	0	0	16	0
Lane Group Flow (vph)	109	19	303	1320	991	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	8.4	8.4	45.1	45.1	27.5	
Effective Green, g (s)	8.4	8.4	45.1	45.1	27.5	
Actuated g/C Ratio	0.13	0.13	0.69	0.69	0.42	
Clearance Time (s)	5.6	5.6	3.3	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	225	199	539	2483	1474	
v/s Ratio Prot			c0.12	0.37	c0.28	
v/s Ratio Perm	c0.06	0.01	0.27			
v/c Ratio	0.48	0.09	0.56	0.53	0.67	
Uniform Delay, d1	26.3	24.9	6.7	4.8	15.1	
Progression Factor	1.00	1.00	2.04	1.53	1.00	
Incremental Delay, d2	1.8	0.2	1.2	0.7	2.5	
Delay (s)	28.0	25.2	14.9	8.1	17.6	
Level of Service	C	C	B	A	B	
Approach Delay (s)	26.4			9.4	17.6	
Approach LOS	C			A	B	

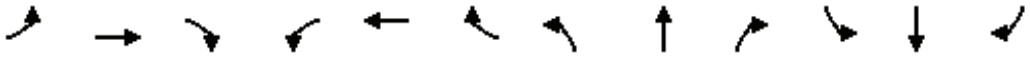
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	68.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1205	1179	250	53	745	141	179	295	35	133	134	671
Future Volume (vph)	1205	1179	250	53	745	141	179	295	35	133	134	671
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	29.1	29.1	41.4	41.4		13.4	13.4	
Total Split (s)	57.8	70.4	70.4	16.6	29.2	29.2	43.0	43.0		43.0	43.0	
Total Split (%)	44.5%	54.2%	54.2%	12.8%	22.5%	22.5%	33.1%	33.1%		33.1%	33.1%	
Yellow Time (s)	3.4	3.4	3.4	3.4	2.0	2.0	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	1.4	
Total Lost Time (s)	8.3	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	7.8	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		None	None	
Act Effct Green (s)	52.8	66.9	66.9	13.5	24.7	24.7	33.7	33.7	130.0	33.7	32.3	94.8
Actuated g/C Ratio	0.41	0.51	0.51	0.10	0.19	0.19	0.26	0.26	1.00	0.26	0.25	0.73
v/c Ratio	0.82	0.70	0.31	0.33	0.88	0.50	0.63	0.66	0.02	1.00	0.31	0.36
Control Delay	40.7	28.7	7.0	48.7	52.1	17.7	51.4	49.8	0.0	111.6	32.6	2.6
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	40.9	28.7	7.0	48.7	52.1	17.7	51.4	49.8	0.0	111.6	32.6	2.9
LOS	D	C	A	D	D	B	D	D	A	F	C	A
Approach Delay		32.2			46.7			47.0			22.6	
Approach LOS		C			D			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 34.6	Intersection LOS: C
Intersection Capacity Utilization 107.9%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1324	1296	275	58	819	155	197	324	38	146	147	737
v/c Ratio	0.82	0.70	0.31	0.33	0.88	0.50	0.63	0.66	0.02	1.00	0.31	0.36
Control Delay	40.7	28.7	7.0	48.7	52.1	17.7	51.4	49.8	0.0	111.6	32.6	2.6
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	40.9	28.7	7.0	48.7	52.1	17.7	51.4	49.8	0.0	111.6	32.6	2.9
Queue Length 50th (m)	156.6	148.1	11.3	13.5	75.8	12.2	43.4	72.3	0.0	38.2	23.7	6.0
Queue Length 95th (m)	185.0	159.5	26.4	25.1	#77.9	11.9	69.4	103.5	0.0	#80.2	35.2	12.3
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	1605	1947	916	188	943	311	342	530	1535	159	509	2055
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	729
Spillback Cap Reductn	29	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.67	0.30	0.31	0.87	0.50	0.58	0.61	0.02	0.92	0.29	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1205	1179	250	53	745	141	179	295	35	133	134	671
Future Volume (vph)	1205	1179	250	53	745	141	179	295	35	133	134	671
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	8.3	5.5	5.5	6.4	4.1	4.1	6.4	6.4	4.0	6.4	7.8	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1689	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.65	1.00	1.00	0.32	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1217	1883	1535	565	1883	2818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1324	1296	275	58	819	155	197	324	38	146	147	737
RTOR Reduction (vph)	0	0	98	0	0	66	0	0	0	0	0	21
Lane Group Flow (vph)	1324	1296	177	58	819	89	197	324	38	146	147	716
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	53.4	65.6	65.6	12.4	26.0	26.0	33.7	33.7	130.0	33.7	33.7	93.5
Effective Green, g (s)	51.5	65.6	65.6	12.4	26.0	26.0	33.7	33.7	130.0	33.7	32.3	93.5
Actuated g/C Ratio	0.40	0.50	0.50	0.10	0.20	0.20	0.26	0.26	1.00	0.26	0.25	0.72
Clearance Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1566	1806	767	162	977	254	315	488	1535	146	467	2026
v/s Ratio Prot	c0.33	0.36		0.03	c0.17			0.17			0.08	0.25
v/s Ratio Perm			0.12			0.07	0.16		0.02	c0.26		
v/c Ratio	0.85	0.72	0.23	0.36	0.84	0.35	0.63	0.66	0.02	1.00	0.31	0.35
Uniform Delay, d1	35.6	25.0	18.1	55.1	50.0	44.8	42.6	43.1	0.0	48.1	39.8	6.9
Progression Factor	1.00	1.00	1.00	0.80	0.79	0.53	1.00	1.00	1.00	0.83	0.79	0.37
Incremental Delay, d2	5.8	1.4	0.2	1.0	6.2	0.8	3.8	3.4	0.0	71.7	0.4	0.1
Delay (s)	41.4	26.4	18.2	45.2	45.4	24.7	46.4	46.5	0.0	111.6	31.9	2.6
Level of Service	D	C	B	D	D	C	D	D	A	F	C	A
Approach Delay (s)		32.5			42.3			43.3			22.2	
Approach LOS		C			D			D			C	

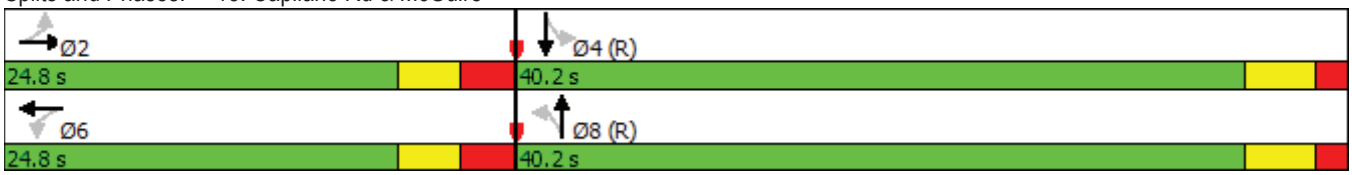
Intersection Summary			
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.90		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	107.9%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	0	4	1571	20	954
Future Volume (vph)	0	4	1571	20	954
Turn Type	NA	NA	NA	Perm	NA
Protected Phases	2	6	8		4
Permitted Phases				4	
Detector Phase	2	6	8	4	4
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	19.0	19.0	19.0
Total Split (s)	24.8	24.8	40.2	40.2	40.2
Total Split (%)	38.2%	38.2%	61.8%	61.8%	61.8%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	7.1	7.1	61.4	61.4	61.4
Actuated g/C Ratio	0.11	0.11	0.94	0.94	0.94
v/c Ratio	0.02	0.11	0.50	0.09	0.30
Control Delay	0.2	17.6	0.9	0.8	0.3
Queue Delay	0.0	0.1	0.0	0.0	0.0
Total Delay	0.2	17.6	1.0	0.8	0.3
LOS	A	B	A	A	A
Approach Delay	0.3	17.6	1.0		0.3
Approach LOS	A	B	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 14 (22%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 0.8	Intersection LOS: A
Intersection Capacity Utilization 64.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Capilano Rd & McGuire



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	4	21	1680	21	1004
v/c Ratio	0.02	0.11	0.50	0.09	0.30
Control Delay	0.2	17.6	0.9	0.8	0.3
Queue Delay	0.0	0.1	0.0	0.0	0.0
Total Delay	0.2	17.6	1.0	0.8	0.3
Queue Length 50th (m)	0.0	0.7	0.0	0.0	0.0
Queue Length 95th (m)	0.0	6.1	21.7	m0.1	2.4
Internal Link Dist (m)	40.6	108.8	75.7		71.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	510	482	3368	224	3380
Starvation Cap Reductn	0	0	17	0	234
Spillback Cap Reductn	0	118	277	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.54	0.09	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

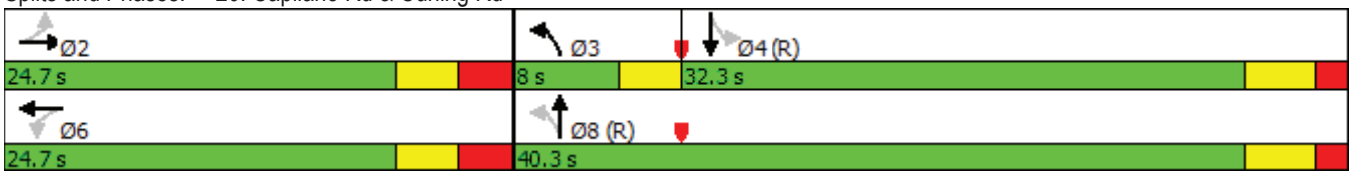
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	0	4	16	0	1571	25	20	954	0
Future Volume (vph)	0	0	4	0	4	16	0	1571	25	20	954	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7			5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frpb, ped/bikes		0.96			0.97			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.85			0.88			1.00		1.00	1.00	
Flt Protected		1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1541			1605			3566		1782	3579	
Flt Permitted		1.00			1.00			1.00		0.13	1.00	
Satd. Flow (perm)		1541			1605			3566		236	3579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	4	0	4	17	0	1654	26	21	1004	0
RTOR Reduction (vph)	0	4	0	0	15	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	6	0	0	1679	0	21	1004	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		1.5			1.5			52.8		52.8	52.8	
Effective Green, g (s)		1.5			1.5			52.8		52.8	52.8	
Actuated g/C Ratio		0.02			0.02			0.81		0.81	0.81	
Clearance Time (s)		5.7			5.7			5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		35			37			2896		191	2907	
v/s Ratio Prot		0.00			c0.00			c0.47			0.28	
v/s Ratio Perm										0.09		
v/c Ratio		0.00			0.17			0.58		0.11	0.35	
Uniform Delay, d1		31.0			31.1			2.2		1.3	1.6	
Progression Factor		1.00			1.00			0.37		0.10	0.09	
Incremental Delay, d2		0.0			2.2			0.7		0.9	0.3	
Delay (s)		31.0			33.3			1.5		1.1	0.4	
Level of Service		C			C			A		A	A	
Approach Delay (s)		31.0			33.3			1.5			0.4	
Approach LOS		C			C			A			A	

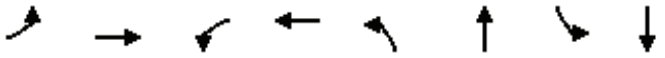
Intersection Summary			
HCM 2000 Control Delay	1.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	64.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	77	46	16	47	143	1482	28	820
Future Volume (vph)	77	46	16	47	143	1482	28	820
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2		6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	3	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	24.7	24.7	8.0	19.0	19.0	19.0
Total Split (s)	24.7	24.7	24.7	24.7	8.0	40.3	32.3	32.3
Total Split (%)	38.0%	38.0%	38.0%	38.0%	12.3%	62.0%	49.7%	49.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	2.7	2.7	0.0	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	3.0	5.0	5.0	5.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.8	9.8	9.8	9.8	49.0	48.0	39.5	39.5
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.75	0.74	0.61	0.61
v/c Ratio	0.42	0.45	0.09	0.38	0.32	0.60	0.17	0.46
Control Delay	31.1	13.8	23.6	23.4	4.6	5.7	4.3	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Total Delay	31.1	13.8	23.6	23.4	4.6	5.8	4.3	2.2
LOS	C	B	C	C	A	A	A	A
Approach Delay		19.9		23.5		5.7		2.3
Approach LOS		B		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 18 (28%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 6.3	Intersection LOS: A
Intersection Capacity Utilization 75.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd





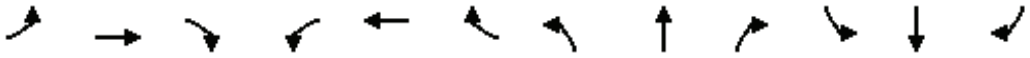
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	81	151	17	103	151	1593	29	980
v/c Ratio	0.42	0.45	0.09	0.38	0.32	0.60	0.17	0.46
Control Delay	31.1	13.8	23.6	23.4	4.6	5.7	4.3	2.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Total Delay	31.1	13.8	23.6	23.4	4.6	5.8	4.3	2.2
Queue Length 50th (m)	9.1	5.2	1.9	9.2	4.1	31.9	0.3	3.9
Queue Length 95th (m)	19.1	17.9	m4.9	16.0	m9.6	64.2	1.3	9.0
Internal Link Dist (m)		40.4		47.6		101.6		75.7
Turn Bay Length (m)	30.0		30.0		20.0		30.0	
Base Capacity (vph)	371	554	356	510	468	2634	167	2125
Starvation Cap Reductn	0	0	0	0	0	291	0	293
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.22	0.27	0.05	0.20	0.32	0.68	0.17	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	77	46	98	16	47	51	143	1482	31	28	820	111
Future Volume (vph)	77	46	98	16	47	51	143	1482	31	28	820	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		3.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.90		1.00	0.92		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1749	1648		1752	1702		1786	3562		1779	3482	
Flt Permitted	0.69	1.00		0.66	1.00		0.22	1.00		0.15	1.00	
Satd. Flow (perm)	1272	1648		1219	1702		420	3562		276	3482	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	81	48	103	17	49	54	151	1560	33	29	863	117
RTOR Reduction (vph)	0	90	0	0	17	0	0	1	0	0	12	0
Lane Group Flow (vph)	81	61	0	17	86	0	151	1592	0	29	968	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	8.4	8.4		8.4	8.4		45.9	45.9		36.7	36.7	
Effective Green, g (s)	8.4	8.4		8.4	8.4		45.9	45.9		36.7	36.7	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.71	0.71		0.56	0.56	
Clearance Time (s)	5.7	5.7		5.7	5.7		3.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	164	212		157	219		426	2515		155	1965	
v/s Ratio Prot		0.04			0.05		0.03	c0.45			0.28	
v/s Ratio Perm	c0.06			0.01			0.22			0.11		
v/c Ratio	0.49	0.29		0.11	0.39		0.35	0.63		0.19	0.49	
Uniform Delay, d1	26.3	25.6		25.0	26.0		4.0	5.1		6.9	8.5	
Progression Factor	1.00	1.00		1.01	1.00		1.12	0.88		0.18	0.14	
Incremental Delay, d2	2.3	0.8		0.3	1.2		0.3	0.8		2.6	0.9	
Delay (s)	28.7	26.4		25.6	27.1		4.8	5.2		3.8	2.0	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.2			26.9			5.2			2.1	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	28	0	4	89	12	0	0	46	9	0	0
Future Volume (Veh/h)	0	28	0	4	89	12	0	0	46	9	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	29	0	4	94	13	0	0	48	9	0	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	107			29			138	144	29	186	138	100
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	107			29			138	144	29	186	138	100
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	95	99	100	100
cM capacity (veh/h)	1484			1584			832	745	1046	738	752	955

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	29	111	48	9
Volume Left	0	4	0	9
Volume Right	0	13	48	0
cSH	1484	1584	1046	738
Volume to Capacity	0.00	0.00	0.05	0.01
Queue Length 95th (m)	0.0	0.1	1.1	0.3
Control Delay (s)	0.0	0.3	8.6	9.9
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.3	8.6	9.9
Approach LOS			A	A

Intersection Summary				
Average Delay	2.7			
Intersection Capacity Utilization	22.5%	ICU Level of Service	A	
Analysis Period (min)	15			

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	41.5	32.9	57.4	84.0	81.6	72.9	77.5
Average Queue (m)	19.7	17.1	47.7	61.8	62.5	53.3	60.7
95th Queue (m)	37.6	32.3	66.8	85.5	81.9	73.7	79.1
Link Distance (m)	41.7			74.4	74.4	68.4	68.4
Upstream Blk Time (%)	3	0		5	2	3	8
Queuing Penalty (veh)	7	0		37	12	9	22
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	2	3	13	8			
Queuing Penalty (veh)	2	3	82	23			

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	196.7	198.4	187.0	180.7	67.5	65.2	88.4	89.4	94.9	44.0	49.4	54.0
Average Queue (m)	177.4	175.0	106.1	106.2	40.0	19.6	62.8	66.6	76.4	36.3	19.3	22.5
95th Queue (m)	252.9	255.3	188.2	182.9	87.5	51.3	95.4	95.3	108.7	58.0	55.2	57.0
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		27.6	27.6
Upstream Blk Time (%)	18	15	1	0		0	15	20	35		10	18
Queuing Penalty (veh)	118	99	5	1		0	48	63	112		47	88
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				19	0	0	18		52	4		
Queuing Penalty (veh)				49	1	0	9		74	10		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	120.8	117.3	42.4	81.6	98.0	72.9	76.1
Average Queue (m)	105.6	79.0	5.5	49.3	37.1	19.2	20.6
95th Queue (m)	141.7	146.5	28.7	87.8	92.1	55.0	59.8
Link Distance (m)	109.4	109.4			91.1	91.1	91.1
Upstream Blk Time (%)	71	25			10	4	4
Queuing Penalty (veh)	0	0			31	12	12
Storage Bay Dist (m)			35.0	70.0			
Storage Blk Time (%)		36	0	22	2		
Queuing Penalty (veh)		13	0	29	3		

Intersection: 15: Capilano Rd & McGuire

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	TR	TR	T	TR	L	T	TR
Maximum Queue (m)	11.4	13.1	74.6	78.1	18.4	68.6	78.3
Average Queue (m)	1.5	4.0	29.2	30.3	6.1	11.4	19.4
95th Queue (m)	7.4	11.5	63.0	64.1	15.5	48.0	61.6
Link Distance (m)	41.5	109.8	78.1	78.1		74.4	74.4
Upstream Blk Time (%)			0	0		3	4
Queuing Penalty (veh)			1	2		14	20
Storage Bay Dist (m)					15.0		
Storage Blk Time (%)			22		4	6	
Queuing Penalty (veh)			0		17	1	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	33.8	40.4	17.7	31.1	31.8	85.2	80.7	27.5	71.9	84.5
Average Queue (m)	14.4	19.2	3.8	13.6	23.3	58.5	59.6	7.2	17.4	46.3
95th Queue (m)	29.2	35.4	12.2	25.8	38.3	82.1	82.6	20.1	57.1	83.1
Link Distance (m)		38.0		47.8		91.1	91.1		78.1	78.1
Upstream Blk Time (%)	0	5				0	0		2	5
Queuing Penalty (veh)	0	11				1	0		11	24
Storage Bay Dist (m)	30.0		30.0		20.0			30.0		
Storage Blk Time (%)	1	6		1	15	23		1	8	
Queuing Penalty (veh)	1	5		0	108	32		3	2	

Intersection: 99: 303 Marine Site Access/Glenaire Dr & Curling Rd

Movement	WB	NB	SB
Directions Served	LTR	LTR	LTR
Maximum Queue (m)	1.6	16.5	8.3
Average Queue (m)	0.0	7.5	2.0
95th Queue (m)	0.0	14.7	7.8
Link Distance (m)	160.1	60.8	251.3
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (m)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Zone Summary

Zone wide Queuing Penalty: 1275

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	193	239	99	527	1686
Future Volume (vph)	193	239	99	527	1686
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.4	12.9	28.9
Total Split (s)	26.6	26.6	8.4	38.4	30.0
Total Split (%)	40.9%	40.9%	12.9%	59.1%	46.2%
Yellow Time (s)	3.3	3.3	3.4	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.4	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?			Yes		Yes
Recall Mode	None	None	None	C-Min	C-Min
Act Effct Green (s)	13.0	13.0	43.0	40.5	32.1
Actuated g/C Ratio	0.20	0.20	0.66	0.62	0.49
v/c Ratio	0.57	0.54	0.34	0.25	1.05
Control Delay	29.3	11.0	17.9	1.6	57.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	11.0	17.9	1.6	57.4
LOS	C	B	B	A	E
Approach Delay	19.2			4.2	57.4
Approach LOS	B			A	E

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 22 (34%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.05	
Intersection Signal Delay: 39.8	Intersection LOS: D
Intersection Capacity Utilization 82.3%	ICU Level of Service E
Analysis Period (min) 15	

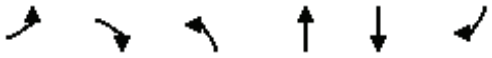
Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	201	249	103	549	1842
v/c Ratio	0.57	0.54	0.34	0.25	1.05
Control Delay	29.3	11.0	17.9	1.6	57.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	29.3	11.0	17.9	1.6	57.4
Queue Length 50th (m)	22.1	6.2	8.1	3.1	~137.5
Queue Length 95th (m)	35.9	21.0	22.3	4.4	#202.5
Internal Link Dist (m)	38.4			71.2	59.6
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	564	626	305	2227	1756
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.36	0.40	0.34	0.25	1.05

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



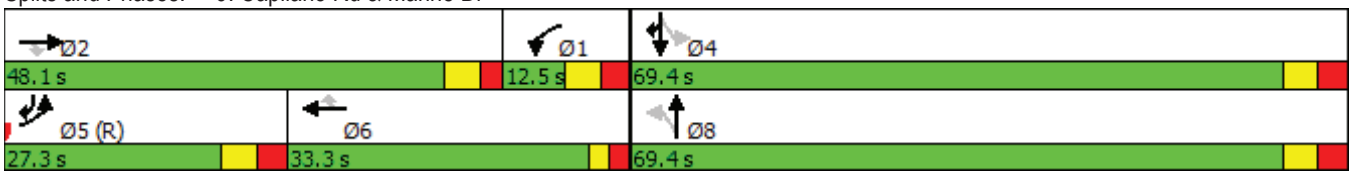
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	193	239	99	527	1686	83
Future Volume (vph)	193	239	99	527	1686	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.4	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.97	1.00	1.00	1.00	
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.99	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1748	1545	1789	3579	3544	
Flt Permitted	0.95	1.00	0.11	1.00	1.00	
Satd. Flow (perm)	1748	1545	216	3579	3544	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	201	249	103	549	1756	86
RTOR Reduction (vph)	0	150	0	0	5	0
Lane Group Flow (vph)	201	99	103	549	1837	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	13.0	13.0	40.5	40.5	31.5	
Effective Green, g (s)	13.0	13.0	40.5	40.5	31.5	
Actuated g/C Ratio	0.20	0.20	0.62	0.62	0.48	
Clearance Time (s)	5.6	5.6	3.4	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	349	309	270	2229	1717	
v/s Ratio Prot			c0.03	0.15	c0.52	
v/s Ratio Perm	c0.12	0.06	0.20			
v/c Ratio	0.58	0.32	0.38	0.25	1.07	
Uniform Delay, d1	23.5	22.2	12.7	5.5	16.8	
Progression Factor	1.00	1.00	3.16	0.22	1.00	
Incremental Delay, d2	2.4	0.6	0.9	0.3	43.2	
Delay (s)	25.9	22.9	40.9	1.5	60.0	
Level of Service	C	C	D	A	E	
Approach Delay (s)	24.2			7.7	60.0	
Approach LOS	C			A	E	

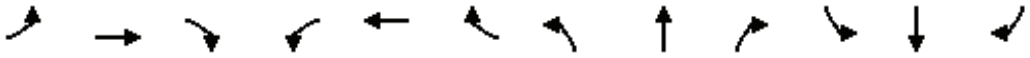
Intersection Summary			
HCM 2000 Control Delay	42.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.9
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	472	761	129	23	933	72	28	86	36	117	67	1812
Future Volume (vph)	472	761	129	23	933	72	28	86	36	117	67	1812
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	29.1	29.1	41.4	41.4		13.4	13.4	
Total Split (s)	27.3	48.1	48.1	12.5	33.3	33.3	69.4	69.4		69.4	69.4	
Total Split (%)	21.0%	37.0%	37.0%	9.6%	25.6%	25.6%	53.4%	53.4%		53.4%	53.4%	
Yellow Time (s)	3.4	3.4	3.4	3.4	2.0	2.0	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		Max	Max	
Act Effct Green (s)	20.9	44.4	44.4	8.4	28.6	28.6	63.6	63.6	130.0	63.6	63.6	90.9
Actuated g/C Ratio	0.16	0.34	0.34	0.06	0.22	0.22	0.49	0.49	1.00	0.49	0.49	0.70
v/c Ratio	0.76	0.64	0.22	0.21	0.89	0.21	0.04	0.10	0.02	0.20	0.07	0.93
Control Delay	60.8	40.0	8.4	53.0	50.9	4.2	18.0	18.4	0.0	20.8	19.3	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	40.0	8.4	53.0	50.9	4.2	18.0	18.4	0.0	20.8	19.3	18.9
LOS	E	D	A	D	D	A	B	B	A	C	B	B
Approach Delay		44.2			47.7			13.9			19.0	
Approach LOS		D			D			B			B	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 95	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 32.9	Intersection LOS: C
Intersection Capacity Utilization 104.0%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	482	777	132	23	952	73	29	88	37	119	68	1849
v/c Ratio	0.76	0.64	0.22	0.21	0.89	0.21	0.04	0.10	0.02	0.20	0.07	0.93
Control Delay	60.8	40.0	8.4	53.0	50.9	4.2	18.0	18.4	0.0	20.8	19.3	18.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.8	40.0	8.4	53.0	50.9	4.2	18.0	18.4	0.0	20.8	19.3	18.9
Queue Length 50th (m)	59.7	97.9	2.6	5.4	87.4	0.0	3.8	11.9	0.0	15.7	8.4	96.8
Queue Length 95th (m)	77.7	112.2	16.6	13.0	#80.8	4.2	9.2	21.3	0.0	m27.1	m15.3	#116.9
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	635	1293	624	113	1097	348	656	921	1535	581	921	1993
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.60	0.21	0.20	0.87	0.21	0.04	0.10	0.02	0.20	0.07	0.93

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	472	761	129	23	933	72	28	86	36	117	67	1812
Future Volume (vph)	472	761	129	23	933	72	28	86	36	117	67	1812
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4	4.0	6.4	6.4	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.90	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1613	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.71	1.00	1.00	0.70	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1342	1883	1535	1188	1883	2818
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	482	777	132	23	952	73	29	88	37	119	68	1849
RTOR Reduction (vph)	0	0	80	0	0	56	0	0	0	0	0	24
Lane Group Flow (vph)	482	777	52	23	952	17	29	88	37	119	68	1825
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	18.4	41.9	41.9	6.2	31.1	31.1	63.6	63.6	130.0	63.6	63.6	88.4
Effective Green, g (s)	18.4	41.9	41.9	6.2	31.1	31.1	63.6	63.6	130.0	63.6	63.6	88.4
Actuated g/C Ratio	0.14	0.32	0.32	0.05	0.24	0.24	0.49	0.49	1.00	0.49	0.49	0.68
Clearance Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	559	1153	489	81	1168	303	656	921	1535	581	921	1916
v/s Ratio Prot	0.12	0.22		0.01	c0.19			0.05			0.04	c0.65
v/s Ratio Perm			0.03			0.01	0.02		0.02	0.10		
v/c Ratio	0.86	0.67	0.11	0.28	0.82	0.06	0.04	0.10	0.02	0.20	0.07	0.95
Uniform Delay, d1	54.6	38.1	30.9	59.8	46.7	38.1	17.3	17.8	0.0	18.8	17.6	18.9
Progression Factor	1.00	1.00	1.00	0.85	0.82	0.39	1.00	1.00	1.00	1.04	1.06	0.69
Incremental Delay, d2	16.0	1.6	0.1	1.3	4.3	0.1	0.0	0.0	0.0	0.6	0.1	9.3
Delay (s)	70.6	39.7	31.0	51.9	42.7	15.1	17.4	17.8	0.0	20.1	18.8	22.4
Level of Service	E	D	C	D	D	B	B	B	A	C	B	C
Approach Delay (s)		49.6			41.0			13.5			22.1	
Approach LOS		D			D			B			C	

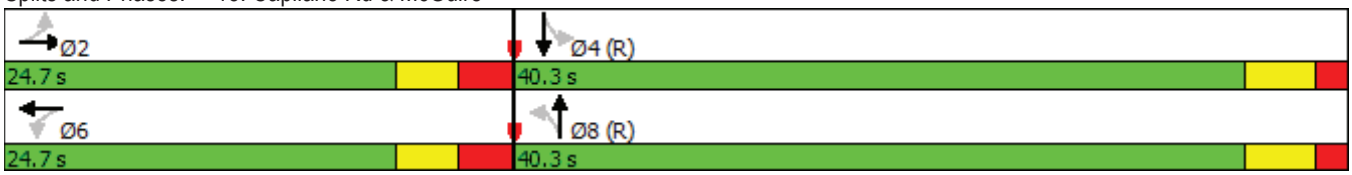
Intersection Summary			
HCM 2000 Control Delay	34.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	104.0%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	0	1	621	20	1902
Future Volume (vph)	0	1	621	20	1902
Turn Type	NA	NA	NA	Perm	NA
Protected Phases	2	6	8		4
Permitted Phases				4	
Detector Phase	2	6	8	4	4
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	19.0	19.0	19.0
Total Split (s)	24.7	24.7	40.3	40.3	40.3
Total Split (%)	38.0%	38.0%	62.0%	62.0%	62.0%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	7.0	7.0	61.5	61.5	61.5
Actuated g/C Ratio	0.11	0.11	0.95	0.95	0.95
v/c Ratio	0.01	0.06	0.20	0.03	0.58
Control Delay	0.0	16.8	0.5	0.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	16.8	0.5	0.5	4.0
LOS	A	B	A	A	A
Approach Delay	0.0	16.8	0.5		4.0
Approach LOS	A	B	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 25 (38%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 3.2	Intersection LOS: A
Intersection Capacity Utilization 73.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Capilano Rd & McGuire



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	1	11	658	21	1961
v/c Ratio	0.01	0.06	0.20	0.03	0.58
Control Delay	0.0	16.8	0.5	0.5	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	0.0	16.8	0.5	0.5	4.0
Queue Length 50th (m)	0.0	0.1	0.0	0.0	8.0
Queue Length 95th (m)	0.0	4.2	12.0	m0.2	m28.1
Internal Link Dist (m)	40.6	108.8	75.7		71.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	474	466	3364	701	3384
Starvation Cap Reductn	0	0	310	0	139
Spillback Cap Reductn	0	0	0	0	154
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.00	0.02	0.22	0.03	0.61

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

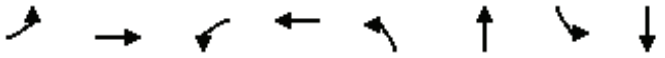
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	1	0	1	10	0	621	17	20	1902	0
Future Volume (vph)	0	0	1	0	1	10	0	621	17	20	1902	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7			5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frpb, ped/bikes		0.96			0.97			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		0.98	1.00	
Frt		0.85			0.86			1.00		1.00	1.00	
Flt Protected		1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1541			1572			3556		1748	3579	
Flt Permitted		1.00			1.00			1.00		0.40	1.00	
Satd. Flow (perm)		1541			1572			3556		739	3579	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	0	1	0	1	10	0	640	18	21	1961	0
RTOR Reduction (vph)	0	1	0	0	10	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	1	0	0	657	0	21	1961	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		1.4			1.4			52.9		52.9	52.9	
Effective Green, g (s)		1.4			1.4			52.9		52.9	52.9	
Actuated g/C Ratio		0.02			0.02			0.81		0.81	0.81	
Clearance Time (s)		5.7			5.7			5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		33			33			2894		601	2912	
v/s Ratio Prot		0.00			c0.00			0.18			c0.55	
v/s Ratio Perm										0.03		
v/c Ratio		0.00			0.04			0.23		0.03	0.67	
Uniform Delay, d1		31.1			31.1			1.4		1.2	2.5	
Progression Factor		1.00			1.00			0.52		0.34	2.17	
Incremental Delay, d2		0.0			0.5			0.2		0.0	0.4	
Delay (s)		31.1			31.6			0.9		0.4	5.8	
Level of Service		C			C			A		A	A	
Approach Delay (s)		31.1			31.6			0.9			5.7	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	73.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	55	55	29	25	46	573	36	1822
Future Volume (vph)	55	55	29	25	46	573	36	1822
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	24.7	24.7	19.0	19.0	19.0	19.0
Total Split (s)	29.0	29.0	29.0	29.0	101.0	101.0	101.0	101.0
Total Split (%)	22.3%	22.3%	22.3%	22.3%	77.7%	77.7%	77.7%	77.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.4	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	2.7	2.7	1.6	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	18.9	18.9	18.9	18.9	100.4	100.4	100.4	100.4
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.77	0.77	0.77	0.77
v/c Ratio	0.30	0.80	0.34	0.19	0.44	0.22	0.06	0.70
Control Delay	52.4	67.2	59.5	28.7	31.1	1.8	5.6	9.1
Queue Delay	0.0	0.4	0.1	0.0	0.0	0.2	0.0	0.2
Total Delay	52.4	67.6	59.7	28.7	31.1	2.0	5.6	9.2
LOS	D	E	E	C	C	A	A	A
Approach Delay		64.3		40.0		4.1		9.2
Approach LOS		E		D		A		A

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 84 (65%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.80	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	57	208	30	52	47	607	37	1930
v/c Ratio	0.30	0.80	0.34	0.19	0.44	0.22	0.06	0.70
Control Delay	52.4	67.2	59.5	28.7	31.1	1.8	5.6	9.1
Queue Delay	0.0	0.4	0.1	0.0	0.0	0.2	0.0	0.2
Total Delay	52.4	67.6	59.7	28.7	31.1	2.0	5.6	9.2
Queue Length 50th (m)	13.1	44.1	6.8	5.8	5.2	8.6	2.1	61.0
Queue Length 95th (m)	25.6	69.6	16.4	16.9	m9.5	13.5	m3.6	179.8
Internal Link Dist (m)		40.4		47.6		101.6		75.7
Turn Bay Length (m)	30.0		30.0		20.0		30.0	
Base Capacity (vph)	232	313	109	323	108	2745	577	2744
Starvation Cap Reductn	0	0	0	0	0	1276	0	179
Spillback Cap Reductn	0	9	3	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.68	0.28	0.16	0.44	0.41	0.06	0.75

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	55	146	29	25	25	46	573	16	36	1822	50
Future Volume (vph)	55	55	146	29	25	25	46	573	16	36	1822	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		5.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.95		1.00	0.97		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	0.95	1.00		0.97	1.00		1.00	1.00		0.95	1.00	
Frt	1.00	0.89		1.00	0.93		1.00	1.00		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1704	1602		1736	1688		1789	3552		1704	3551	
Flt Permitted	0.72	1.00		0.33	1.00		0.07	1.00		0.42	1.00	
Satd. Flow (perm)	1297	1602		612	1688		140	3552		747	3551	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	57	57	151	30	26	26	47	591	16	37	1878	52
RTOR Reduction (vph)	0	27	0	0	22	0	0	1	0	0	1	0
Lane Group Flow (vph)	57	181	0	30	30	0	47	606	0	37	1929	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	18.9	18.9		18.9	18.9		100.4	100.4		100.4	100.4	
Effective Green, g (s)	18.9	18.9		18.9	18.9		100.4	100.4		100.4	100.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.77	0.77		0.77	0.77	
Clearance Time (s)	5.7	5.7		5.7	5.7		5.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	188	232		88	245		108	2743		576	2742	
v/s Ratio Prot		c0.11			0.02			0.17			c0.54	
v/s Ratio Perm	0.04			0.05			0.33			0.05		
v/c Ratio	0.30	0.78		0.34	0.12		0.44	0.22		0.06	0.70	
Uniform Delay, d1	49.7	53.5		49.9	48.3		5.1	4.1		3.5	7.4	
Progression Factor	1.00	1.00		1.01	1.00		2.37	0.38		1.23	0.96	
Incremental Delay, d2	0.9	15.1		2.3	0.2		10.0	0.2		0.2	1.3	
Delay (s)	50.6	68.7		52.8	48.4		22.0	1.7		4.5	8.3	
Level of Service	D	E		D	D		C	A		A	A	
Approach Delay (s)		64.8			50.0			3.2			8.3	
Approach LOS		E			D			A			A	

Intersection Summary			
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	85.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	14	0	9	17	3	0	1	39	13	1	0
Future Volume (Veh/h)	0	14	0	9	17	3	0	1	39	13	1	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	15	0	9	18	3	0	1	41	14	1	0
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	21			15			53	54	15	94	52	20
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	21			15			53	54	15	94	52	20
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	96	98	100	100
cM capacity (veh/h)	1595			1603			941	833	1065	851	834	1058

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	15	30	42	15
Volume Left	0	9	0	14
Volume Right	0	3	41	0
cSH	1595	1603	1058	850
Volume to Capacity	0.00	0.01	0.04	0.02
Queue Length 95th (m)	0.0	0.1	0.9	0.4
Control Delay (s)	0.0	2.2	8.5	9.3
Lane LOS		A	A	A
Approach Delay (s)	0.0	2.2	8.5	9.3
Approach LOS			A	A

Intersection Summary			
Average Delay	5.5		
Intersection Capacity Utilization	22.3%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB	B13	B13
Directions Served	L	R	L	T	T	T	TR	T	T
Maximum Queue (m)	51.7	37.5	33.1	30.2	33.1	94.6	98.5	222.0	223.7
Average Queue (m)	30.4	28.4	17.1	10.9	14.1	80.7	88.3	213.4	213.5
95th Queue (m)	50.7	42.2	28.5	24.4	28.0	103.6	93.7	218.4	219.0
Link Distance (m)	41.7			74.4	74.4	65.2	65.2	207.3	207.3
Upstream Blk Time (%)	4	0				37	87	82	96
Queuing Penalty (veh)	15	0				0	0	0	0
Storage Bay Dist (m)		30.0	50.0						
Storage Blk Time (%)	7	6							
Queuing Penalty (veh)	17	12							

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	89.3	86.1	99.3	101.9	67.5	66.0	90.5	89.1	95.8	44.0	54.9	53.5
Average Queue (m)	55.1	50.6	62.4	61.7	21.9	11.1	76.8	78.7	86.9	29.7	33.6	37.3
95th Queue (m)	83.4	79.3	90.7	92.3	66.9	40.1	95.7	93.9	100.5	59.5	64.7	64.1
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		27.8	27.8
Upstream Blk Time (%)						0	32	42	61		29	37
Queuing Penalty (veh)						0	108	143	206		147	187
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				8	0	0	37		75	0		
Queuing Penalty (veh)				11	0	0	8		54	1		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	SB	SB	SB	SB
Directions Served	L	T	L	T	R	R
Maximum Queue (m)	27.9	31.8	32.3	26.4	75.3	73.1
Average Queue (m)	7.8	11.3	12.2	5.4	40.1	41.2
95th Queue (m)	20.7	26.1	25.9	16.7	65.0	65.7
Link Distance (m)	109.4	109.4		91.1	91.1	91.1
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (m)			70.0			
Storage Blk Time (%)		0				
Queuing Penalty (veh)		0				

Intersection: 15: Capilano Rd & McGuire

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	TR	TR	T	TR	L	T	TR
Maximum Queue (m)	6.9	12.8	23.9	24.0	13.6	89.4	88.4
Average Queue (m)	0.4	3.1	8.6	8.6	2.3	37.1	64.5
95th Queue (m)	3.2	10.3	18.6	19.8	9.2	91.9	102.1
Link Distance (m)	41.5	109.8	78.1	78.1		74.4	74.4
Upstream Blk Time (%)						2	7
Queuing Penalty (veh)						20	68
Storage Bay Dist (m)					15.0		
Storage Blk Time (%)			2		0	3	
Queuing Penalty (veh)			0		1	1	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	37.0	42.6	21.4	32.6	22.6	32.4	36.9	11.6	61.3	94.6
Average Queue (m)	15.8	31.4	7.7	9.1	8.0	10.6	13.0	2.5	10.7	73.7
95th Queue (m)	33.3	48.2	17.9	21.5	20.0	24.9	26.6	9.7	41.0	91.4
Link Distance (m)		38.0		47.8		91.1	91.1		78.1	78.1
Upstream Blk Time (%)	0	13		0					0	7
Queuing Penalty (veh)	0	33		0					4	69
Storage Bay Dist (m)	30.0		30.0		20.0			30.0		
Storage Blk Time (%)	1	20	0	0	7	1			0	
Queuing Penalty (veh)	3	11	0	0	19	0			0	

Intersection: 99: 303 Marine Access/Glenaire Dr & Curling Rd

Movement	WB	NB
Directions Served	LTR	LTR
Maximum Queue (m)	1.8	17.4
Average Queue (m)	0.1	7.3
95th Queue (m)	1.3	14.6
Link Distance (m)	160.1	60.8
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (m)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Zone Summary

Zone wide Queuing Penalty: 1137

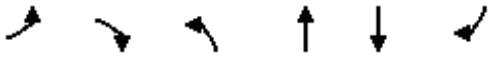
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Configurations					
Traffic Volume (vph)	104	139	289	1245	835
Future Volume (vph)	104	139	289	1245	835
Turn Type	Perm	Perm	pm+pt	NA	NA
Protected Phases			5	2	6
Permitted Phases	4	4	2		
Detector Phase	4	4	5	2	6
Switch Phase					
Minimum Initial (s)	7.0	7.0	5.0	7.0	7.0
Minimum Split (s)	26.6	26.6	8.3	12.9	28.9
Total Split (s)	26.6	26.6	9.0	38.4	29.4
Total Split (%)	40.9%	40.9%	13.8%	59.1%	45.2%
Yellow Time (s)	3.3	3.3	3.3	3.4	3.4
All-Red Time (s)	2.3	2.3	0.0	2.5	2.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	3.3	5.9	5.9
Lead/Lag			Lead		Lag
Lead-Lag Optimize?					
Recall Mode	None	None	None	C-Max	C-Max
Act Effct Green (s)	9.8	9.8	48.8	47.4	28.6
Actuated g/C Ratio	0.15	0.15	0.75	0.73	0.44
v/c Ratio	0.42	0.41	0.55	0.50	0.65
Control Delay	29.2	8.5	14.7	8.5	17.9
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	29.2	8.5	14.7	8.6	17.9
LOS	C	A	B	A	B
Approach Delay	17.4			9.8	17.9
Approach LOS	B			A	B

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 9 (14%), Referenced to phase 2:NBTL and 6:SBT, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 68.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: Capilano Rd & Fullerton Ave

Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	109	146	304	1311	1008
v/c Ratio	0.42	0.41	0.55	0.50	0.65
Control Delay	29.2	8.5	14.7	8.5	17.9
Queue Delay	0.0	0.0	0.0	0.1	0.0
Total Delay	29.2	8.5	14.7	8.6	17.9
Queue Length 50th (m)	12.1	0.0	37.4	94.6	49.1
Queue Length 95th (m)	23.5	12.5	44.8	70.4	75.5
Internal Link Dist (m)	38.4			71.2	62.7
Turn Bay Length (m)		30.0	50.0		
Base Capacity (vph)	564	597	557	2611	1550
Starvation Cap Reductn	0	0	0	360	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.24	0.55	0.58	0.65

Intersection Summary



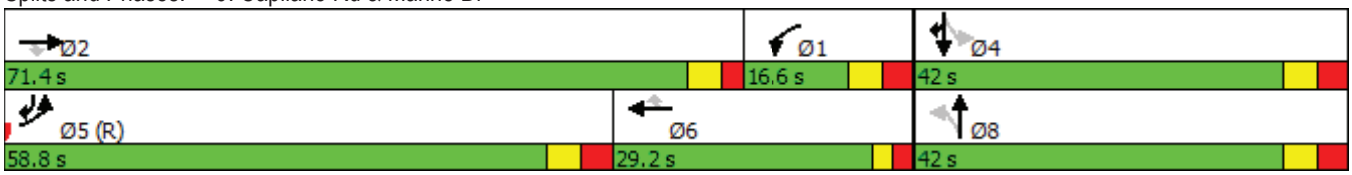
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	104	139	289	1245	835	123
Future Volume (vph)	104	139	289	1245	835	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.6	5.6	3.3	5.9	5.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	
Frpb, ped/bikes	1.00	0.97	1.00	1.00	0.99	
Flpb, ped/bikes	0.98	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1748	1545	1788	3579	3485	
Flt Permitted	0.95	1.00	0.16	1.00	1.00	
Satd. Flow (perm)	1748	1545	308	3579	3485	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	109	146	304	1311	879	129
RTOR Reduction (vph)	0	127	0	0	16	0
Lane Group Flow (vph)	109	19	304	1311	992	0
Confl. Peds. (#/hr)	25	25	25			25
Turn Type	Perm	Perm	pm+pt	NA	NA	
Protected Phases			5	2	6	
Permitted Phases	4	4	2			
Actuated Green, G (s)	8.4	8.4	45.1	45.1	27.5	
Effective Green, g (s)	8.4	8.4	45.1	45.1	27.5	
Actuated g/C Ratio	0.13	0.13	0.69	0.69	0.42	
Clearance Time (s)	5.6	5.6	3.3	5.9	5.9	
Vehicle Extension (s)	3.2	3.2	3.0	3.0	3.0	
Lane Grp Cap (vph)	225	199	539	2483	1474	
v/s Ratio Prot			c0.12	0.37	c0.28	
v/s Ratio Perm	c0.06	0.01	0.27			
v/c Ratio	0.48	0.09	0.56	0.53	0.67	
Uniform Delay, d1	26.3	24.9	6.7	4.8	15.1	
Progression Factor	1.00	1.00	2.08	1.50	1.00	
Incremental Delay, d2	1.8	0.2	1.2	0.7	2.5	
Delay (s)	28.0	25.2	15.2	7.9	17.6	
Level of Service	C	C	B	A	B	
Approach Delay (s)	26.4			9.3	17.6	
Approach LOS	C			A	B	

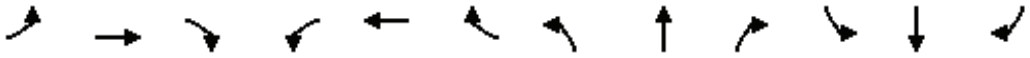
Intersection Summary			
HCM 2000 Control Delay	13.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	14.8
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1208	1179	250	53	745	142	179	296	35	124	129	674
Future Volume (vph)	1208	1179	250	53	745	142	179	296	35	124	129	674
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Detector Phase	5	2	2	1	6	6	8	8		4	4	4 5
Switch Phase												
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	11.4	26.5	26.5	11.4	29.1	29.1	41.4	41.4		13.4	13.4	
Total Split (s)	58.8	71.4	71.4	16.6	29.2	29.2	42.0	42.0		42.0	42.0	
Total Split (%)	45.2%	54.9%	54.9%	12.8%	22.5%	22.5%	32.3%	32.3%		32.3%	32.3%	
Yellow Time (s)	3.4	3.4	3.4	3.4	2.0	2.0	3.4	3.4		3.4	3.4	
All-Red Time (s)	3.0	2.1	2.1	3.0	2.1	2.1	3.0	3.0		3.0	3.0	
Lost Time Adjust (s)	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	1.4	
Total Lost Time (s)	8.3	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	7.8	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?		Yes	Yes	Yes								
Recall Mode	C-Min	Min	Min	None	Min	Min	None	None		None	None	
Act Effct Green (s)	53.7	67.5	67.5	14.0	24.8	24.8	32.6	32.6	130.0	32.6	31.2	94.7
Actuated g/C Ratio	0.41	0.52	0.52	0.11	0.19	0.19	0.25	0.25	1.00	0.25	0.24	0.73
v/c Ratio	0.81	0.70	0.31	0.32	0.88	0.50	0.64	0.69	0.02	1.01	0.31	0.36
Control Delay	39.4	28.2	6.7	47.7	51.3	17.5	53.0	51.8	0.0	117.0	32.3	2.9
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	39.6	28.2	6.7	47.7	51.3	17.5	53.0	51.8	0.0	117.0	32.3	3.2
LOS	D	C	A	D	D	B	D	D	A	F	C	A
Approach Delay		31.4			46.0			48.7			22.5	
Approach LOS		C			D			D			C	

Intersection Summary	
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 0 (0%), Referenced to phase 5:EBL, Start of Green, Master Intersection	
Natural Cycle: 115	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.01	
Intersection Signal Delay: 34.2	Intersection LOS: C
Intersection Capacity Utilization 107.4%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 9: Capilano Rd & Marine Dr





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	1327	1296	275	58	819	156	197	325	38	136	142	741
v/c Ratio	0.81	0.70	0.31	0.32	0.88	0.50	0.64	0.69	0.02	1.01	0.31	0.36
Control Delay	39.4	28.2	6.7	47.7	51.3	17.5	53.0	51.8	0.0	117.0	32.3	2.9
Queue Delay	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
Total Delay	39.6	28.2	6.7	47.7	51.3	17.5	53.0	51.8	0.0	117.0	32.3	3.2
Queue Length 50th (m)	155.0	147.5	10.7	13.6	75.7	13.5	43.8	73.3	0.0	34.8	22.8	6.6
Queue Length 95th (m)	183.2	157.1	25.4	24.9	#78.5	11.1	69.9	104.9	0.0	#74.9	34.0	14.2
Internal Link Dist (m)		205.6			64.4			105.4			101.6	
Turn Bay Length (m)			60.0	65.0		36.5			35.0	70.0		
Base Capacity (vph)	1634	1976	929	194	948	312	336	515	1535	147	495	2054
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	728
Spillback Cap Reductn	35	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.83	0.66	0.30	0.30	0.86	0.50	0.59	0.63	0.02	0.93	0.29	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1208	1179	250	53	745	142	179	296	35	124	129	674
Future Volume (vph)	1208	1179	250	53	745	142	179	296	35	124	129	674
Ideal Flow (vphpl)	2100	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			10%			0%			0%	
Total Lost time (s)	8.3	5.5	5.5	6.4	4.1	4.1	6.4	6.4	4.0	6.4	7.8	6.4
Lane Util. Factor	*1.00	0.95	1.00	1.00	0.91	1.00	1.00	1.00	1.00	1.00	1.00	0.88
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.84	1.00	1.00	0.96	1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.94	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3955	3579	1520	1700	4885	1270	1789	1883	1535	1690	1883	2818
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.65	1.00	1.00	0.30	1.00	1.00
Satd. Flow (perm)	3955	3579	1520	1700	4885	1270	1230	1883	1535	540	1883	2818
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	1327	1296	275	58	819	156	197	325	38	136	142	741
RTOR Reduction (vph)	0	0	99	0	0	65	0	0	0	0	0	21
Lane Group Flow (vph)	1327	1296	176	58	819	91	197	325	38	136	142	720
Confl. Peds. (#/hr)	100		10	10		100			100	100		
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	Free	Perm	NA	pt+ov
Protected Phases	5	2		1	6			8			4	4 5
Permitted Phases			2			6	8		Free	4		
Actuated Green, G (s)	54.3	66.2	66.2	12.9	26.2	26.2	32.6	32.6	130.0	32.6	32.6	93.3
Effective Green, g (s)	52.4	66.2	66.2	12.9	26.2	26.2	32.6	32.6	130.0	32.6	31.2	93.3
Actuated g/C Ratio	0.40	0.51	0.51	0.10	0.20	0.20	0.25	0.25	1.00	0.25	0.24	0.72
Clearance Time (s)	6.4	5.5	5.5	6.4	4.1	4.1	6.4	6.4		6.4	6.4	
Vehicle Extension (s)	3.0	3.0	3.0	2.5	3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	1594	1822	774	168	984	255	308	472	1535	135	451	2022
v/s Ratio Prot	c0.34	0.36		0.03	c0.17			0.17			0.08	0.26
v/s Ratio Perm			0.12			0.07	0.16		0.02	c0.25		
v/c Ratio	0.83	0.71	0.23	0.35	0.83	0.36	0.64	0.69	0.02	1.01	0.31	0.36
Uniform Delay, d1	34.9	24.5	17.7	54.6	49.8	44.6	43.5	44.1	0.0	48.7	40.6	7.0
Progression Factor	1.00	1.00	1.00	0.80	0.78	0.52	1.00	1.00	1.00	0.79	0.77	0.41
Incremental Delay, d2	5.2	1.3	0.2	0.9	5.9	0.8	4.3	4.2	0.0	76.6	0.4	0.1
Delay (s)	40.1	25.9	17.9	44.5	44.8	24.0	47.8	48.3	0.0	115.1	31.6	3.0
Level of Service	D	C	B	D	D	C	D	D	A	F	C	A
Approach Delay (s)		31.6			41.6			44.8			21.9	
Approach LOS		C			D			D			C	

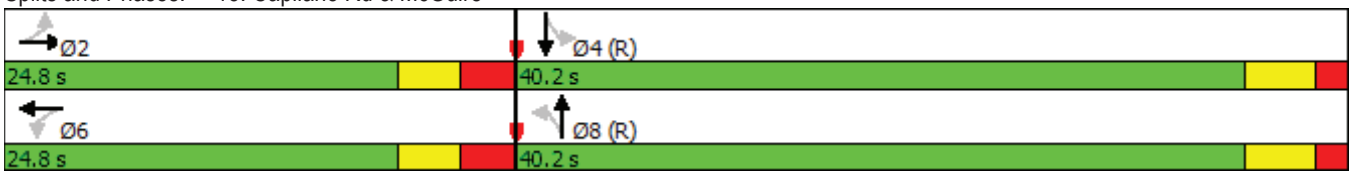
Intersection Summary			
HCM 2000 Control Delay	33.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	20.2
Intersection Capacity Utilization	107.4%	ICU Level of Service	G
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Configurations					
Traffic Volume (vph)	0	4	1564	20	955
Future Volume (vph)	0	4	1564	20	955
Turn Type	NA	NA	NA	Perm	NA
Protected Phases	2	6	8		4
Permitted Phases				4	
Detector Phase	2	6	8	4	4
Switch Phase					
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	19.0	19.0	19.0
Total Split (s)	24.8	24.8	40.2	40.2	40.2
Total Split (%)	38.2%	38.2%	61.8%	61.8%	61.8%
Yellow Time (s)	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.0	5.0	5.0
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	7.1	7.1	61.4	61.4	61.4
Actuated g/C Ratio	0.11	0.11	0.94	0.94	0.94
v/c Ratio	0.02	0.11	0.50	0.09	0.30
Control Delay	0.2	17.6	0.9	0.8	0.3
Queue Delay	0.0	0.1	0.0	0.0	0.0
Total Delay	0.2	17.6	0.9	0.8	0.3
LOS	A	B	A	A	A
Approach Delay	0.3	17.6	0.9		0.3
Approach LOS	A	B	A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 16 (25%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 0.8	Intersection LOS: A
Intersection Capacity Utilization 64.5%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 15: Capilano Rd & McGuire



Lane Group	EBT	WBT	NBT	SBL	SBT
Lane Group Flow (vph)	4	21	1672	21	1005
v/c Ratio	0.02	0.11	0.50	0.09	0.30
Control Delay	0.2	17.6	0.9	0.8	0.3
Queue Delay	0.0	0.1	0.0	0.0	0.0
Total Delay	0.2	17.6	0.9	0.8	0.3
Queue Length 50th (m)	0.0	0.7	0.0	0.0	0.0
Queue Length 95th (m)	0.0	6.1	21.1	m0.1	2.4
Internal Link Dist (m)	40.6	108.8	75.7		71.2
Turn Bay Length (m)				15.0	
Base Capacity (vph)	510	482	3368	226	3380
Starvation Cap Reductn	0	0	17	0	234
Spillback Cap Reductn	0	118	275	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.01	0.06	0.54	0.09	0.32

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

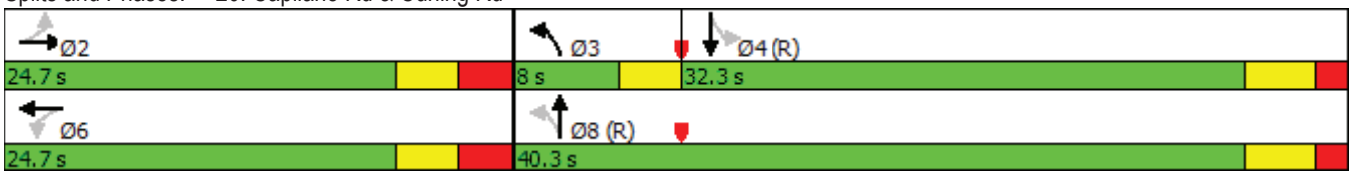
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	4	0	4	16	0	1564	25	20	955	0
Future Volume (vph)	0	0	4	0	4	16	0	1564	25	20	955	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		5.7			5.7			5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00			0.95		1.00	0.95	
Frpb, ped/bikes		0.96			0.97			1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00			1.00		1.00	1.00	
Frt		0.85			0.88			1.00		1.00	1.00	
Flt Protected		1.00			1.00			1.00		0.95	1.00	
Satd. Flow (prot)		1541			1605			3566		1782	3579	
Flt Permitted		1.00			1.00			1.00		0.13	1.00	
Satd. Flow (perm)		1541			1605			3566		238	3579	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	4	0	4	17	0	1646	26	21	1005	0
RTOR Reduction (vph)	0	4	0	0	15	0	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	6	0	0	1671	0	21	1005	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)		1.5			1.5			52.8		52.8	52.8	
Effective Green, g (s)		1.5			1.5			52.8		52.8	52.8	
Actuated g/C Ratio		0.02			0.02			0.81		0.81	0.81	
Clearance Time (s)		5.7			5.7			5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.0			3.0		3.0	3.0	
Lane Grp Cap (vph)		35			37			2896		193	2907	
v/s Ratio Prot		0.00			c0.00			c0.47			0.28	
v/s Ratio Perm										0.09		
v/c Ratio		0.00			0.17			0.58		0.11	0.35	
Uniform Delay, d1		31.0			31.1			2.2		1.3	1.6	
Progression Factor		1.00			1.00			0.34		0.10	0.09	
Incremental Delay, d2		0.0			2.2			0.7		0.9	0.3	
Delay (s)		31.0			33.3			1.4		1.0	0.4	
Level of Service		C			C			A		A	A	
Approach Delay (s)		31.0			33.3			1.4			0.4	
Approach LOS		C			C			A			A	

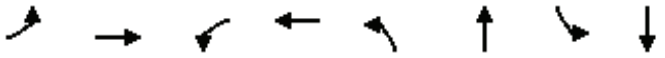
Intersection Summary			
HCM 2000 Control Delay	1.3	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	64.5%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	68	49	16	51	146	1484	28	820
Future Volume (vph)	68	49	16	51	146	1484	28	820
Turn Type	Perm	NA	Perm	NA	pm+pt	NA	Perm	NA
Protected Phases		2		6	3	8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	3	8	4	4
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	5.0	7.0	7.0	7.0
Minimum Split (s)	24.7	24.7	24.7	24.7	8.0	19.0	19.0	19.0
Total Split (s)	24.7	24.7	24.7	24.7	8.0	40.3	32.3	32.3
Total Split (%)	38.0%	38.0%	38.0%	38.0%	12.3%	62.0%	49.7%	49.7%
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	3.4	3.4	3.4
All-Red Time (s)	2.7	2.7	2.7	2.7	0.0	1.6	1.6	1.6
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	3.0	5.0	5.0	5.0
Lead/Lag					Lead		Lag	Lag
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	None	C-Max	C-Max	C-Max
Act Effct Green (s)	9.4	9.4	9.4	9.4	49.4	48.4	39.8	39.8
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.76	0.74	0.61	0.61
v/c Ratio	0.39	0.45	0.10	0.41	0.33	0.60	0.17	0.46
Control Delay	30.8	15.2	24.1	24.8	4.1	5.1	4.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Total Delay	30.8	15.2	24.1	24.8	4.1	5.3	4.1	2.2
LOS	C	B	C	C	A	A	A	A
Approach Delay		20.4		24.7		5.2		2.2
Approach LOS		C		C		A		A

Intersection Summary	
Cycle Length: 65	
Actuated Cycle Length: 65	
Offset: 20 (31%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 75.7%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 20: Capilano Rd & Curling Rd





Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	72	144	17	108	154	1595	29	981
v/c Ratio	0.39	0.45	0.10	0.41	0.33	0.60	0.17	0.46
Control Delay	30.8	15.2	24.1	24.8	4.1	5.1	4.1	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
Total Delay	30.8	15.2	24.1	24.8	4.1	5.3	4.1	2.2
Queue Length 50th (m)	8.1	5.7	1.8	9.9	2.8	23.6	0.3	3.8
Queue Length 95th (m)	17.5	18.4	m5.0	16.9	m8.7	60.5	1.3	8.9
Internal Link Dist (m)		40.4		47.6		101.6		75.7
Turn Bay Length (m)	30.0		30.0		20.0		30.0	
Base Capacity (vph)	369	550	358	513	472	2653	170	2144
Starvation Cap Reductn	0	0	0	0	0	296	0	302
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.26	0.05	0.21	0.33	0.68	0.17	0.53

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	49	87	16	51	51	146	1484	31	28	820	112
Future Volume (vph)	68	49	87	16	51	51	146	1484	31	28	820	112
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.7	5.7		5.7	5.7		3.0	5.0		5.0	5.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.98	1.00		0.98	1.00		1.00	1.00		0.99	1.00	
Frt	1.00	0.90		1.00	0.93		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1750	1663		1752	1710		1786	3562		1779	3481	
Flt Permitted	0.69	1.00		0.67	1.00		0.22	1.00		0.15	1.00	
Satd. Flow (perm)	1266	1663		1227	1710		423	3562		278	3481	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	72	52	92	17	54	54	154	1562	33	29	863	118
RTOR Reduction (vph)	0	81	0	0	17	0	0	1	0	0	12	0
Lane Group Flow (vph)	72	63	0	17	91	0	154	1594	0	29	969	0
Confl. Peds. (#/hr)	25		25	25		25	25		25	25		25
Turn Type	Perm	NA		Perm	NA		pm+pt	NA		Perm	NA	
Protected Phases		2			6		3	8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	8.0	8.0		8.0	8.0		46.3	46.3		37.1	37.1	
Effective Green, g (s)	8.0	8.0		8.0	8.0		46.3	46.3		37.1	37.1	
Actuated g/C Ratio	0.12	0.12		0.12	0.12		0.71	0.71		0.57	0.57	
Clearance Time (s)	5.7	5.7		5.7	5.7		3.0	5.0		5.0	5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	204		151	210		431	2537		158	1986	
v/s Ratio Prot		0.04			0.05		0.03	c0.45			0.28	
v/s Ratio Perm	c0.06			0.01			0.22			0.10		
v/c Ratio	0.46	0.31		0.11	0.43		0.36	0.63		0.18	0.49	
Uniform Delay, d1	26.5	26.0		25.3	26.4		3.9	4.9		6.7	8.3	
Progression Factor	1.00	1.00		1.01	1.00		1.00	0.83		0.18	0.14	
Incremental Delay, d2	2.2	0.9		0.3	1.4		0.3	0.8		2.5	0.8	
Delay (s)	28.7	26.9		26.0	28.0		4.2	4.8		3.7	2.0	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		27.5			27.7			4.7			2.0	
Approach LOS		C			C			A			A	

Intersection Summary			
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	13.7
Intersection Capacity Utilization	75.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 3: Capilano Rd & Fullerton Ave

Movement	EB	EB	NB	NB	NB	SB	SB
Directions Served	L	R	L	T	T	T	TR
Maximum Queue (m)	47.0	36.6	57.4	86.0	81.5	71.3	75.8
Average Queue (m)	21.0	17.5	44.8	59.5	61.1	53.8	61.9
95th Queue (m)	41.2	33.2	65.2	84.8	81.2	77.7	80.5
Link Distance (m)	41.7			74.4	74.4	68.4	68.4
Upstream Blk Time (%)	3	0		3	1	8	15
Queuing Penalty (veh)	9	0		22	10	21	38
Storage Bay Dist (m)		30.0	50.0				
Storage Blk Time (%)	4	4	9	8			
Queuing Penalty (veh)	6	4	53	23			

Intersection: 9: Capilano Rd & Marine Dr

Movement	EB	EB	EB	EB	EB	WB	WB	WB	WB	WB	B11	B11
Directions Served	L	L	T	T	R	L	T	T	T	R	T	T
Maximum Queue (m)	212.5	216.2	176.2	175.5	67.5	66.1	85.6	85.0	91.9	44.0	43.7	45.4
Average Queue (m)	165.7	161.6	86.6	87.5	36.3	18.5	51.3	57.0	67.3	35.8	5.1	8.2
95th Queue (m)	243.3	243.0	149.4	144.5	84.4	46.0	79.9	85.4	101.7	57.0	25.7	32.4
Link Distance (m)	206.7	206.7	206.7	206.7			66.2	66.2	66.2		27.6	27.6
Upstream Blk Time (%)	7	5	0	0		0	2	4	12		1	2
Queuing Penalty (veh)	44	33	1	0		0	8	13	38		5	11
Storage Bay Dist (m)					60.0	65.0				36.5		
Storage Blk Time (%)				17	0	0	3		35	1		
Queuing Penalty (veh)				43	1	0	2		49	2		

Intersection: 9: Capilano Rd & Marine Dr

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	L	T	R	L	T	R	R
Maximum Queue (m)	117.7	114.0	42.5	81.3	85.1	40.5	42.0
Average Queue (m)	99.0	68.7	4.2	45.9	36.0	16.1	15.3
95th Queue (m)	143.4	137.0	24.8	88.9	94.0	46.1	44.2
Link Distance (m)	109.4	109.4			91.1	91.1	91.1
Upstream Blk Time (%)	61	16			15	1	1
Queuing Penalty (veh)	0	0			48	3	4
Storage Bay Dist (m)			35.0	70.0			
Storage Blk Time (%)		28	0	22	3		
Queuing Penalty (veh)		10	0	29	4		

Intersection: 15: Capilano Rd & McGuire

Movement	EB	WB	NB	NB	SB	SB	SB
Directions Served	TR	TR	T	TR	L	T	TR
Maximum Queue (m)	9.0	15.1	62.0	63.2	21.3	70.1	75.2
Average Queue (m)	0.7	4.3	23.5	24.1	5.7	19.4	27.3
95th Queue (m)	4.8	12.0	50.5	51.1	16.7	66.2	75.7
Link Distance (m)	41.5	109.8	78.1	78.1		74.4	74.4
Upstream Blk Time (%)				0		8	6
Queuing Penalty (veh)				0		39	28
Storage Bay Dist (m)					15.0		
Storage Blk Time (%)			19		5	14	
Queuing Penalty (veh)			0		23	3	

Intersection: 20: Capilano Rd & Curling Rd

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	TR	L	T	TR
Maximum Queue (m)	29.9	39.4	12.6	32.2	31.8	75.5	76.5	28.4	67.2	82.5
Average Queue (m)	11.9	17.3	3.0	13.2	23.5	54.8	56.5	7.7	22.9	49.3
95th Queue (m)	24.7	33.2	10.0	25.9	36.8	75.8	77.3	20.5	70.0	85.1
Link Distance (m)		38.0		47.8		91.1	91.1		78.1	78.1
Upstream Blk Time (%)	0	1							13	5
Queuing Penalty (veh)	0	2							60	24
Storage Bay Dist (m)	30.0		30.0		20.0			30.0		
Storage Blk Time (%)	0	2		0	14	21		0	16	
Queuing Penalty (veh)	0	2		0	104	31		0	5	

Zone Summary

Zone wide Queuing Penalty: 855